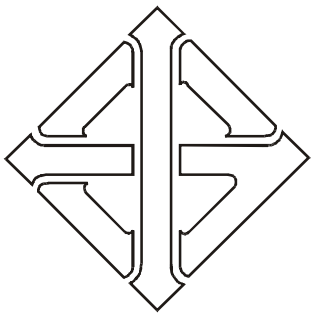

มาตรฐานผลิตภัณฑ์อุตสาหกรรม

THAI INDUSTRIAL STANDARD

มอก. 1696 – 2552

IEC 80416 – 1(2001 – 06)

หลักการพื้นฐานสำหรับสัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์

เล่ม 1 การสร้างสัญลักษณ์ต้นแบบ

BASIC PRINCIPLES FOR GRAPHICAL SYMBOLS FOR USE ON EQUIPMENT-

PART 1: CREATION OF SYMBOL ORIGINALS

สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม

กระทรวงอุตสาหกรรม

ICS 01.080.01

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มาตรฐานผลิตภัณฑ์อุตสาหกรรม

หลักการพื้นฐานสำหรับสัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์

เล่ม 1 การสร้างสัญลักษณ์ต้นแบบ

มอก. 1696 – 2552

สำนักงานมาตรฐานผลิตภัณฑ์อุตสาหกรรม
กระทรวงอุตสาหกรรม ถนนพระรามที่ 6 กรุงเทพฯ 10400
โทรศัพท์ 02 202 3300

ประกาศในราชกิจจานุเบกษา ฉบับประกาศและงานทั่วไป เล่ม 127 ตอนพิเศษ 136ง
วันที่ 26 พฤศจิกายน พุทธศักราช 2553

มาตรฐานผลิตภัณฑ์อุตสาหกรรมหลักการทั่วไปสำหรับการสร้างสัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์ ได้ประกาศใช้ครั้งแรก โดยรับ IEC 416: 1988 General principles for the creation of graphical symbols for use on equipment มาใช้ในระดับเหมือนกันทุกประการ (Identical) โดยใช้ IEC ฉบับภาษาอังกฤษเป็นหลัก โดยประกาศในราชกิจจานุเบกษา ฉบับประกาศทั่วไป เล่มที่ 117 ตอนที่ 78ง วันที่ 28 กันยายน พุทธศักราช 2543

เนื่องจากIECได้แก้ไขปรับปรุงมาตรฐาน IEC 416: 1988 เป็น IEC 80416-1(2001-06) จึงได้ยกเลิกมาตรฐานเดิม และกำหนดมาตรฐานใหม่โดยรับ IEC 80416-1(2001) Basic principles for graphical symbols for use on equipment Part 1: Creation of symbol originals มาใช้ในระดับเหมือนกันทุกประการโดยใช้มาตรฐาน IEC ฉบับภาษาอังกฤษเป็นหลัก

คณะกรรมการมาตรฐานผลิตภัณฑ์อุตสาหกรรมได้พิจารณามาตรฐานนี้แล้ว เห็นสมควรเสนอรัฐมนตรีประกาศตาม มาตรา 15 แห่งพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม พ.ศ. 2511

ประกาศกระทรวงอุตสาหกรรม

ฉบับที่ 4241 (พ.ศ. 2553)

ออกตามความในพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม

พ.ศ. 2511

เรื่อง ยกเลิกมาตรฐานผลิตภัณฑ์อุตสาหกรรม

หลักการทั่วไปสำหรับการสร้างสัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์

และกำหนดมาตรฐานผลิตภัณฑ์อุตสาหกรรม

หลักการพื้นฐานสำหรับสัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์

เล่ม 1 การสร้างสัญลักษณ์ต้นแบบ

โดยที่เป็นการสมควรปรับปรุงมาตรฐานผลิตภัณฑ์อุตสาหกรรม หลักการทั่วไปสำหรับการสร้างสัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์ มาตรฐานเลขที่ มอก.1696-2541

อาศัยอำนาจตามความในมาตรา 15 แห่งพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม พ.ศ. 2511 รัฐมนตรีว่าการกระทรวงอุตสาหกรรมออกประกาศยกเลิกประกาศกระทรวงอุตสาหกรรม ฉบับที่ 2701 (พ.ศ.2543) ออกตามความในพระราชบัญญัติมาตรฐานผลิตภัณฑ์อุตสาหกรรม พ.ศ.2511 เรื่อง กำหนดมาตรฐานผลิตภัณฑ์อุตสาหกรรม หลักการทั่วไปสำหรับการสร้างสัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์ ลงวันที่ 12 มิถุนายน พ.ศ.2543 และออกประกาศกำหนดมาตรฐานผลิตภัณฑ์อุตสาหกรรม หลักการพื้นฐานสำหรับสัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์ เล่ม 1 การสร้างสัญลักษณ์ต้นแบบ มาตรฐานเลขที่ มอก.1696-2552 ขึ้นใหม่ ดังมีรายละเอียดต่อท้ายประกาศนี้

ทั้งนี้ให้มีผลตั้งแต่วันถัดจากวันที่ประกาศในราชกิจจานุเบกษา เป็นต้นไป

ประกาศ ณ วันที่ 31 สิงหาคม พ.ศ. 2553

ชัยวุฒิ บรรณวัฒน์

รัฐมนตรีว่าการกระทรวงอุตสาหกรรม

มาตรฐานผลิตภัณฑ์อุตสาหกรรม
หลักการพื้นฐานสำหรับสัญลักษณ์รูปภาพ ที่ใช้กับบริภัณฑ์
เล่ม 1 การสร้างสัญลักษณ์ต้นแบบ

มาตรฐานผลิตภัณฑ์อุตสาหกรรมนี้กำหนดขึ้นโดยรับ IEC 80416-1(2001-06) Basic principles for graphical symbols for use on equipment Part 1: Creation of symbol originals มาใช้ในระดับเหมือนกันทุกประการ (identical) โดยใช้ IEC ฉบับภาษาอังกฤษเป็นหลัก

มาตรฐานอุตสาหกรรมชุด 80416นี้ กำหนดข้อกำหนดพื้นฐานและแนวทางของการสร้างสัญลักษณ์ต้นแบบรูปภาพที่ใช้กับบริภัณฑ์ ตัวอักษรบนบริภัณฑ์ต่าง ๆ ตามที่กำหนดไว้ใน ISO และ IEC

ส่วนที่ 1 ของมาตรฐานเป็นการกำหนดข้อกำหนดพื้นฐานหลักสำหรับการสร้างสัญลักษณ์ต้นแบบสำหรับใช้บนบริภัณฑ์ เพื่อให้สอดคล้องกับของความหมายของสัญลักษณ์ที่ตั้งใจไว้ ส่วนนี้จะประกอบด้วยกฎในการออกแบบสัญลักษณ์ เช่น รูปร่าง ขนาด และการจัดเตรียมข้อความต่าง ๆ

สัญลักษณ์รูปภาพที่ใช้กับบริภัณฑ์อาจนำไปใช้เพื่อ

- ชี้บ่งบริภัณฑ์หรือชิ้นส่วนของบริภัณฑ์ (เช่น อุปกรณ์ควบคุมหรือจอภาพ)
- ชี้บ่งสถานะของการทำงาน (เช่น เปิด ปิด เตือน)
- ระบุส่วนต่อ (เช่น ขั้วต่อ จุดต่อเชื่อม)
- แสดงข้อมูลบนภาชนะบรรจุ (เช่น ชี้บ่งรายละเอียด ข้อแนะนำในการขนย้าย)
- แสดงคำสั่งในการใช้บริภัณฑ์ (เช่น คำเตือน ข้อจำกัดของการใช้)

มาตรฐานผลิตภัณฑ์อุตสาหกรรมนี้ไม่ครอบคลุมสัญลักษณ์ต้นแบบ สำหรับ

- สัญลักษณ์ความปลอดภัย
- การใช้ในแบบ (drawing) และแผนภูมิ (Diagram)
- การใช้ในเอกสารทางเทคนิคของผลิตภัณฑ์ การจัดทำเอกสารทางเทคนิคของผลิตภัณฑ์
- การเป็นสาธารณสนเทศ

รายละเอียดให้เป็นไปตาม IEC 80416-1 (2001)

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CH-1211 Geneva 20
Switzerland
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Web : www.iec.ch

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

BASIC PRINCIPLES FOR GRAPHICAL SYMBOLS FOR USE ON EQUIPMENT –

Part 1: Creation of symbol originals

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of the IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
6) Attention is drawn to the possibility that some of the elements of this international standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 80416-1 has been prepared by IEC subcommittee 3C: Graphical symbols for use on equipment, of IEC technical committee 3: Information structures, documentation and graphical symbols.

This International Standard has been prepared in co-operation with ISO/TC145.

This standard replaces ISO 3461-1 (1988) and IEC 60416 (1988).

The text of this standard is based on the following documents:

FDIS	Report on voting
3C/600/FDIS	3C/654/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

In order to collect all requirements concerning relevant basic principles within one single numerical series, ISO technical committee 145: Graphical symbols and IEC technical committee 3 agreed to publish all parts of this International Standard within the 80416 series. The Technical Management Board of ISO and the Committee of Action of IEC have decided that, for each part of this series, one organisation shall be chosen responsible. The technical committees involved have agreed not to change any part of International Standard 80416 without mutual agreement.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 3.

International Standard 80416 consists of the following parts, under the general title *Basic principles for graphical symbols for use on equipment*:

Part 1: 2001,	Creation of symbol originals (*published by IEC*)
Part 2: 2001,	Form and use of arrows (*published by ISO*)
Part 3,	Guidelines for the application of graphical symbols (*being prepared, and to be published by IEC*)
Part 4,	Supplementary guidelines for the adaptation of graphical symbols for use on screen and displays (icons) (*under consideration*)

The committee has decided that the contents of this publication will remain unchanged until 2003. At this date, the publication will be

- reconfirmed;
- withdrawn;
- replaced by a revised edition, or
- amended.

Introduction

A graphical symbol is a visually perceptible figure used to transmit information independently of language. Graphical symbols are used on equipment for a wide range of purposes. For such symbols, consistency in the design of families of symbols used in one location or on similar equipment is an important issue, as is legibility when these symbols are reduced to small dimensions. Thus, there is a need to standardize the principles for creating graphical symbols for use on equipment to ensure visual clarity, to maintain consistency and thereby to improve recognition.

This multi-part standard addresses the basic rules used to create graphical symbols for use on equipment, including line widths, form and use of arrows, negation elements, and use of the basic pattern which serves as a guideline for drawing equipment symbols. These design principles are required to be used for all graphical symbols for use on equipment: the standardized graphical symbols of which are found in ISO 7000 and IEC 60417.

BASIC PRINCIPLES FOR GRAPHICAL SYMBOLS FOR USE ON EQUIPMENT –

Part 1: Creation of symbol originals

1 Scope

International Standard 80416 series provides principles and guidelines for the creation of symbol originals and the application of graphical symbols for use on equipment prepared within ISO and IEC.

This Part 1 of the standard specifies the key principles for the creation of symbol originals for use on equipment. In accordance with the intended meaning of the symbol originals, it contains rules for design such as shape and size, and also for preparation of the accompanying texts.

This standard applies to graphical symbols used:

- to identify the equipment or a part of the equipment (for example, a control or display);
- to indicate functional states or functions (for example, on, off, alarm);
- to designate connections (for example, terminals, filling points);
- to provide information on packaging (for example, identification of content, instructions for handling);
- to provide instructions for the operation of the equipment (for example, limitations of use).

This standard does not apply to symbol originals for:

- safety signs;
- use on drawings and diagrams;
- use in technical documentation of products and in technical product documentation;
- use for public information.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 80416-2:2001, Basic principles for graphical symbols for use on equipment – Part 2: Form and use of arrows

ISO 7000, Graphical symbols for use on equipment – Index and synopsis

IEC 60417-1, Graphical symbols for use on equipment – Part 1: Overview and application

IEC 60417-2, Graphical symbols for use on equipment – Part 2: Symbol originals

ISO 3864, Safety colours and safety signs

3 Definitions

For the purpose of this International Standard, the following definitions apply.

3.1
graphical symbol
visually perceptible figure with a particular meaning used to transmit information independently of language

3.2
graphical symbol element
part of a symbol original with a particular meaning

NOTE 1 Letters, numerals, punctuation marks and mathematical symbols may be used as graphical symbol elements (see ISO 31 and IEC 60027).

NOTE 2 A graphical symbol element with a specific meaning may be used to provide a common concept in the construction of a symbol family.

3.3
symbol original
drawing of a graphical symbol, prepared in accordance with this standard, used for reference or reproduction purposes

3.4
corner marking
part of a symbol original, four of which define the frame of the symbol original; see 7.3 and figure 8

3.5
title
unique name by which a graphical symbol is identified and spoken of

NOTE The title should be as short as possible; it is only intended to provide a unique name for the graphical symbol and not to describe its application.

3.6
description
normative text attached to the graphical representation of the symbol original which defines the purpose, the application and the use of the symbol original

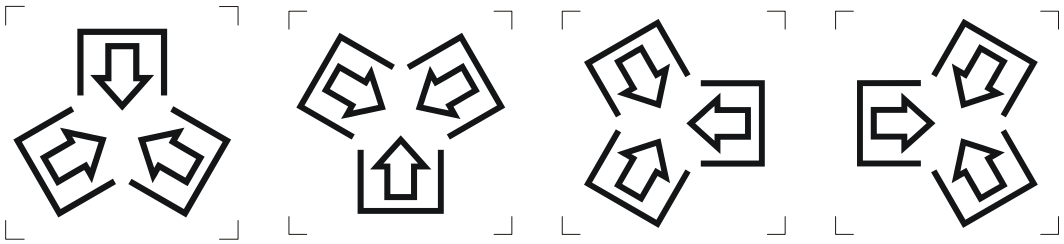
4 Meaning

4.1 Assignment

The meaning assigned to each symbol original is the result of associating a title, a graphical representation and a description of the application. The assigned meaning should be un-ambiguous and independent of terms related to a special technique or discipline.

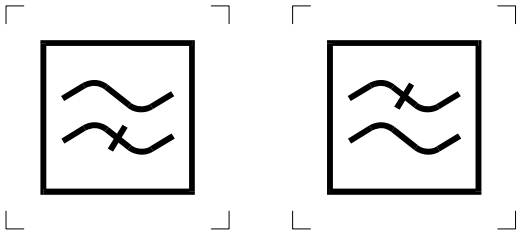
4.2 Orientation of graphical symbols

Graphical symbols should normally be used in the orientation specified by the symbol originals. Care should be taken to avoid ambiguity during creation of symbol originals and subsequent use of graphical symbols whose meaning is dependent on their orientation. Such ambiguity could occur, for instance, when graphical symbols are placed on rotary knobs. Symbol originals should whenever possible be created so as to preserve their meaning in any orientation as the example a) in figure 1. However, when the meaning of a graphical symbol does depend on its orientation, as in the case of the examples b) in figure 1, this shall be explicitly stated in the description of the symbol original.



ISO 7000-0414: Cores in moulding position

a) Example of a graphical symbol the meaning of which is independent of its orientation



IEC 60417-5091: High-pass filter

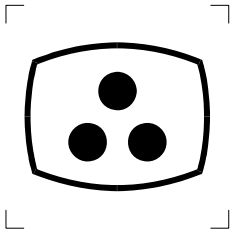
IEC 60417-5092: Low-pass filter

b) Examples of graphical symbols the meaning of which depend upon their orientation

Figure 1 – Graphical symbols in different orientation

5 Combination of graphical symbols

To represent certain concepts, graphical symbols or graphical symbol elements may be combined to form a new symbol original. The meaning assigned to the new symbol original shall be consistent with the meanings of the individual graphical symbols or graphical symbol element used as shown in figure 2.



IEC 60417-5050: Colour television

Figure 2 – Example of combination of graphical symbols
(IEC 60417-5049: “Television” combined with IEC 60417-5048: “Colour” to give IEC 60417-5050: “Colour television”)

6 Creation principles

6.1 Creation of symbol original

A symbol original shall be created within the basic pattern shown in figure 5 taking into account specifications in 7 and 9.

6.2 Design guidelines

The design of a symbol original shall be:

a) simple, in order to facilitate perception and reproduction;

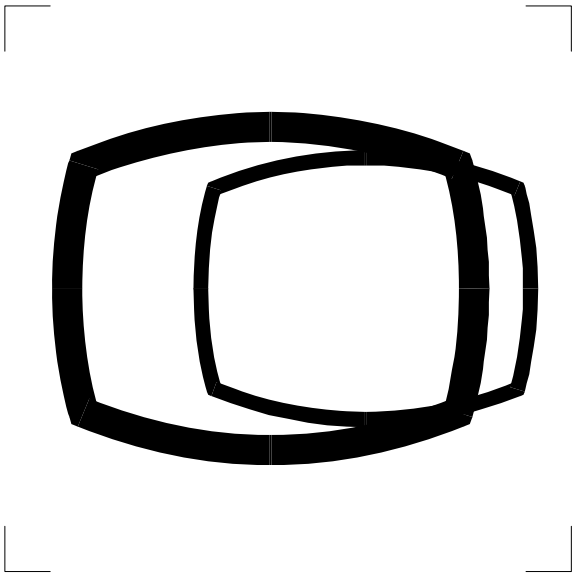
b) readily distinguishable from those of other graphical symbols with which it may be used;

c) easily associated with its intended meaning, that is either self-evident or easily learned;

d) such that it can be produced by usual manufacturing and reproduction methods.

6.3 Line thickness

The line thickness of a symbol original shall be 2 mm. As an exception, for the purpose of visual clarity only, a line thickness of 4 mm may be used in combination with the 2 mm as in figure 3.



IEC 60417-5063: Horizontal picture shift

Figure 3 – Examples of the use of line-thickness

The specified 2 mm line-thickness is intended to be used solely in the collection of standardized symbol originals purely for overall consistency in the same International Standards: ISO 7000 and IEC 60417-2. When applying symbol originals to a specific field, the line-thickness may be modified, provided that the visual design criteria are maintained.

It is recommended that graphical symbols intended for specific fields of application are also published in the appropriate technical product standard. See also 8.

6.4 Spacing

The minimum spacing between lines of a symbol original shall be chosen to take into account visual clarity and the reproduction methods to be used. As a guide, the minimum space between parallel lines should not be less than 1,5 times the line thickness.

6.5 Angles

Angles smaller than 30° in a symbol original should be avoided.

6.6 Filled areas

Filled areas in a symbol original should be avoided except when the meaning or legibility of the symbol original requires that an area is filled.

6.7 Symbol original with arrows

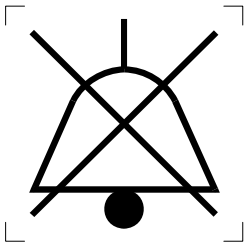
For a symbol original which incorporates arrows, the principles in ISO 80416-2 shall apply.

6.8 Character symbols

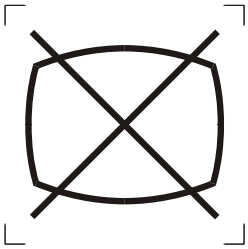
For constituent elements of symbol originals such as letters, numbers, punctuation marks and mathematical symbols, a simple character form should be used. The minimum character height in the symbol original should be 10 mm.

6.9 Negation

Negation shall be indicated by a cross of line thickness 2 mm formed by two diagonal bars at right angles, as in the example a) in figure 4. As an exception, for purpose of visual clarity only, the angle at which the diagonal bars meet may deviate from 90°.



a) IEC 60417-5576: Bell cancel



b) IEC 60417-5477: Cancel picture

Figure 4 – Examples of negation

The negation cross can be used to indicate a negated, cancelled or opposite function. The meaning of a negation depends on the graphical symbol to be negated. For example, in the case of a graphical symbol identifying the control for a function, a negation normally indicates the negated function or cancellation as in examples a) and b) of figure 4. In the case of a graphical symbol indicating a functional state, the negation normally indicates the opposite functional state as in example b) of figure 4. Where the purpose of a symbol is to indicate an action (for example, an instruction), a negation is normally used to indicate the opposite action.

The red circle with the red negation bar as defined in ISO 3864 for safety applications shall not be used for negation of graphical symbols for use on equipment.

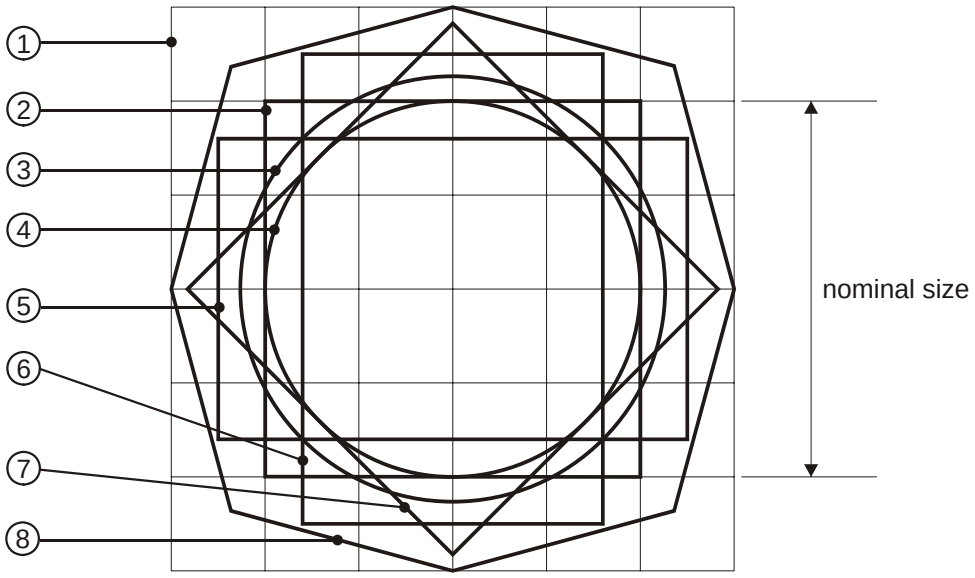
NOTE 1 The standardization of a negated symbol original is only necessary if the negated version represents a specific meaning.

NOTE 2 A diagonal bar running from top left to bottom right indicates a negation in graphical symbols for public information and therefore should not be used.

7 Basic pattern

7.1 Structure

The basic pattern shown in figure 5 shall be used as the basis for the creation of a symbol original (see 7.2). It is used as a tool for the design of a symbol original to ensure a balanced visual impression between graphical symbols.



Reference	Description
1	Square of 75 mm lateral length, forming the largest horizontal and vertical dimensions of the basic pattern and divided into a grid of 12,5 mm line spacing.
2	Basic square of 50 mm lateral length. This dimension is equal to the nominal size 50 mm of the symbol original.
3	Basic circle of 56,6 mm diameter, having approximately the same surface area as the basic square 2.
4	Circle of 50 mm diameter, being the inscribed circle of the basic square 2.
5, 6	Two rectangles having the same surface area as the basic square 2 and a width of 40 mm and of height 62,5 mm. They are mutually perpendicular, each drawn to cross symmetrically opposite sides of the basic square 2.
7	Basic square 2 of 50 mm rotated by 45°.
8	Octagon formed by lines at 15° to the outer sides of the grid 1; the outer border of the basic pattern.

Figure 5 – Basic pattern

NOTE The basic pattern as templates for drawing software can be downloaded from SC 3C area of the IEC web site.

7.2 Application of the basic pattern

To achieve a visual impression of uniformity between graphical symbols, the symbol original shall fit into the basic pattern according to the following principles:

a) for a symbol original consisting of a single geometrical form, such as a circle, a square or a rectangle, the corresponding geometrical forms of the basic pattern should be used;

b) for the other symbol originals, care should be taken to ensure that the symbol originals have the same visual impression and uniformity and are consistent with those in ISO 7000 and IEC 60417-2;

c) the key element in the basic pattern, with regard to the nominal size, is the 50 mm basic square 2. The basic circle 3 and the rectangles 5 and 6 have the same surface area. Circles without external parts should therefore be drawn on the basic circle 3, and rectangles should be drawn on the rectangles 5 and 6, in order to achieve the same visual impression of size as the 50 mm basic square 2. Circles with external graphical symbol elements should be drawn on the circle 4;

d) the visual impression of size of symbol originals drawn using the basic pattern corresponds to the 50 mm nominal size;

e) symbol originals should be created to the largest size possible, in line with the above principles, and shall not extend beyond the basic pattern, the octagon 8;

f) insofar as it is practicable, the lines of the symbol original should be centred on the lines of the basic pattern.

In case the centre of a line being in contact with the octagon 8, half of a thickness of the line may extend beyond the octagon. However, the outer border of the line shall not exceed the 75 mm square 1 as shown in figure 6.

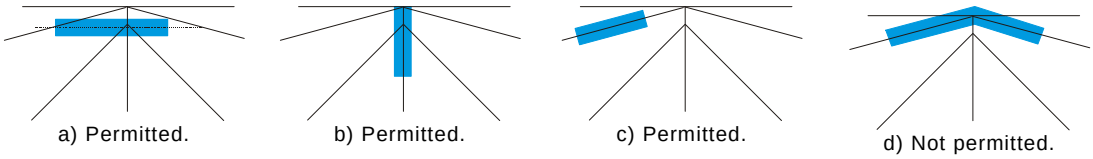
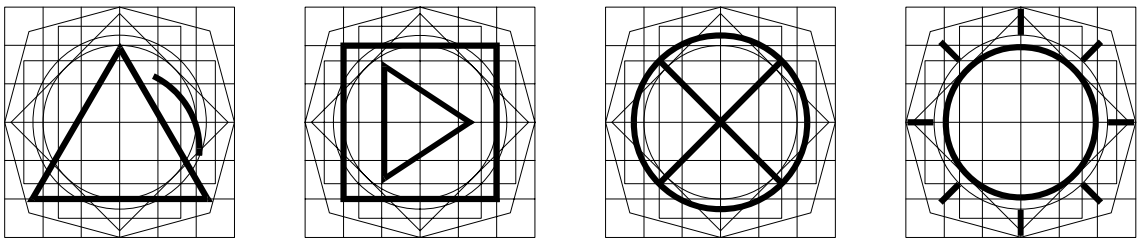
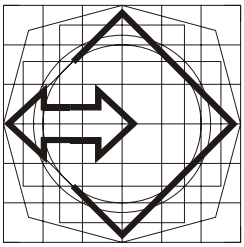


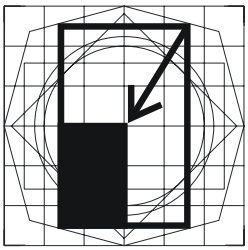
Figure 6 – Examples of permitted and not permitted lines beyond the octagon

Some examples of application of the basic pattern are shown in figure 7.

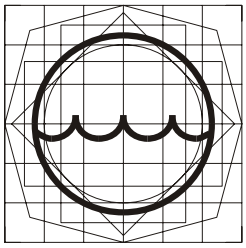




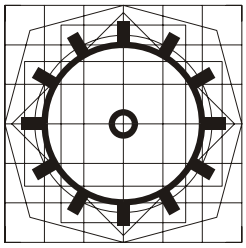
i) ISO 7000-1107:
Write and read data into and from store



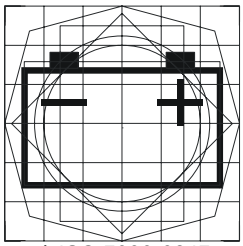
j) ISO 7000-0679:
Reduction



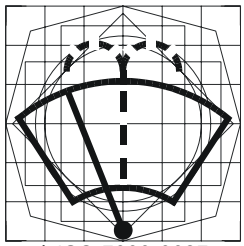
k) ISO 7000-0524:
Water energy



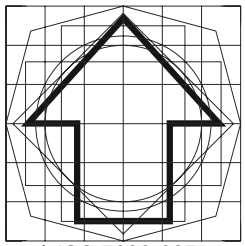
l) ISO 7000-1103:
Rotating brush



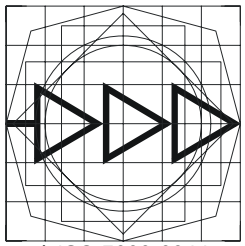
m) ISO 7000-0247:
Battery charging condition



n) ISO 7000-0087:
Windscreen wiper and washer



o) ISO 7000-0251:
Functional arrow



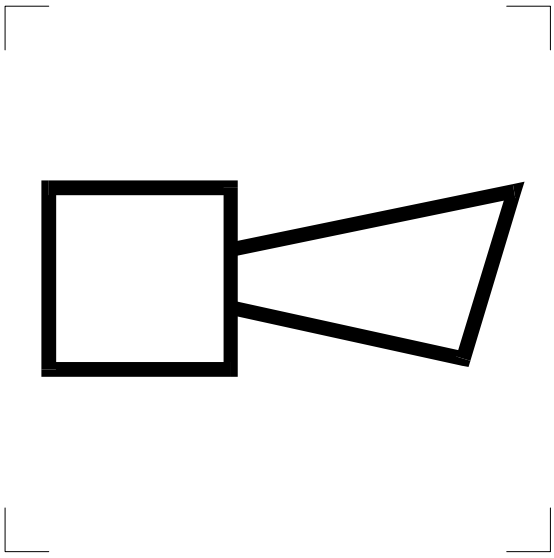
p) ISO 7000-0944:
Accelerated fast run; accelerated fast speed

Figure 7 – Application examples

7.3 Specification of symbol original

The symbol original is a drawing of the graphical symbol, including the corner markings as shown in figure 8. The corner markings correspond to the corners of the 75 mm square 1 in figure 5; these are used to facilitate accurate positioning and scaling of the symbol original.

Each corner marking consists of a vertical as well as a horizontal line each of 6,0 mm.



IEC 60417-5014: Horn

Figure 8 – Example of a symbol original

NOTE 1 Symbol originals should be drawn using the basic pattern corresponding to the 50 mm nominal size. The size of a graphical symbol as an application of the symbol original can be increased or reduced by re-scaling accordingly.

NOTE 2 Where the intended size of reproduction of a symbol original is small, or the viewing distance is large, for example on a small key cap, particular attention should be given to avoiding unnecessary detail and complexity in the creation of the symbol original. It should be noted that legibility also depends upon other factors such as the level of illumination and luminance contrast.

8 Application of symbol originals

In practice, to improve the appearance and perceptibility of a symbol original in use, or to coordinate with the design of the equipment to which it is to be applied, it may be necessary, for example:

a) to change the line thickness;

b) to round the corners;

c) to fill areas of the graphical symbol;

d) to modify the design of arrows according to ISO 80416-2;

e) to interrupt crossing lines;

f) to negate a graphical symbol.

The user is normally free to make such changes provided that the visual design criteria of the symbol originals are maintained.

NOTE Detailed guidelines for the application of symbol originals are under development.

9 Creation procedure

Creation of a symbol original should follow the following procedure:

a) identification of a need for the graphical symbol;

b) clear and unambiguous description of the purpose of the graphical symbol and identification of any orientation considerations (see 4.2);

c) analysis of the characteristics of the intended users, the task involved and context of use;

d) consideration of existing or proposed symbol originals in the same and/or related fields;

e) design of the symbol original as described in Clause 7;

f) consideration of legibility and comprehension of the symbol original in the context of its use.

All newly created symbol originals shall be adopted, in line with ISO/IEC Directives, with the designation systems specified in Clause 10.

NOTE The degree of comprehension may be influenced by the education of the target users and/or the provision of instructional materials.

10 Designation systems

Any symbol original shall have only one registration number, either from IEC TC 3/SC 3C or from ISO TC 145/SC 3. The designation system applied to each symbol original in IEC 60417 and ISO 7000 consists of the following:

a) the reference of the International Standard, either IEC 60417 or ISO 7000;

b) a hyphen;

c) the registration number of the symbol original.

Example: IEC 60417-5115
ISO 7000-0091

NOTE 1 Registration numbers below 5000 have been assigned to ISO 7000 and numbers above 5000 have been assigned to IEC 60417.

NOTE 2 In exceptional cases where the meaning of a symbol original is extended to include a new meaning, the symbol original with the new meaning may have the same registration number with a dashed numerical suffix.

Example: IEC 60417-5277-1,

IEC 60417-5277-2, ...

NOTE 3 – In exceptional cases where there are two alternative graphical representations for one function, these are distinguished by the addition of a letter after the registration number. No alternative graphical representations are permitted for new symbol originals.

Example: IEC 60417-5107A,

IEC 60417-5107B.

Bibliography

ISO 7001:1990, *Public information symbols*

IEC 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60617 (all parts), *Graphical symbols for diagrams*

ISO 81714-1:1999, *Design of graphical symbols for use in the technical documentation of products – Part 1: Basic rules*

ISO 31 (all parts), *Quantities and units*

ISO 3098 (all parts), *Technical product documentation – Lettering*

ISO/TR 7239:1984, *Development and principles for application of public information symbols*