SLOVENSKI STANDARD
SIST EN 15429-4:2015

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Stroji za pometanje - 4. del: Simboli za nadzor opravil in drugi znaki

Sweepers - Part 4: Symbols for operator controls and other displays

Kehrmaschinen - Teil 4: Symbole für Bedienelemente und andere Anzeigen

Balayeuses - Partie 4: Symboles pour les commandes de l'opérateur et autres afficheurs

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ICS:

01.080.30	Grafični simboli za uporabo v risbah, diagramih, načrtih, zemljevidih v strojništvu in gradbeništvu ter v ustrezni tehnični proizvodni dokumentaciji	Graphical symbols for use on mechanical engineering and construction drawings, diagrams, plans, maps and in relevant technical product documentation
13.030.40	Naprave in oprema za odstranjevanje in obdelavo odpadkov	Installations and equipment for waste disposal and treatment
43.160	Vozila za posebne namene	Special purpose vehicles

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Sweepers - Part 4: Symbols for operator controls and other displays

Balayeuses - Partie 4: Symboles pour les commandes de l'opérateur et autres afficheurs

Kehrmaschinen - Teil 4: Symbole für Bedienelemente und andere Anzeigen

This European Standard was approved by CEN on 3 January 2015.

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Foreword

This document (EN 15429-4:2015) has been prepared by Technical Committee CEN/TC 337 “Road operation equipment and products”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2015, and conflicting national standards shall be withdrawn at the latest by September 2015.

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

This document (EN 15429-4:2015) is part of a series of documents made up of the following parts:

— EN 15429-1, *Sweepers — Part 1: Classification and Terminology*;

— EN 15429-2, *Sweepers — Part 2: Performance requirements and test methods*;

— EN 15429-3, *Sweepers — Part 3: Efficiency of particulate matter collection — Testing and Evaluation*;

— EN 15429-4, *Sweepers — Part 4: Symbols for operator controls and other displays*.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

Generally, all surface cleaning machines – sweepers, are designed to clean paved surfaces of varying textures associated with areas exposed to vehicular traffic, pedestrians and those within industrial complexes.

Most of these sweepers are equipped with sweep gear to scarify debris with a pick-up system that collects and conveys the spoil into a hopper. This hopper can be discharged at dumping grounds, unloading stations, into containers or at refuse transfer stations.

Sweeping applications are mainly related to the physical size and dimensions of the sweeper. Sweepers of larger dimensions are designed to operate mainly on streets, highways, motorways, large parking areas and within industrial complexes.

Sweepers of smaller dimensions are designed for the cleaning of inner town streets, pedestrian zones, pavements, bicycle lanes, car parking facilities market places and within industrial plants etc. Manoeuvrability is one of the main features of this category of sweeper.

Depending on the dimensions, sweeping attachment equipment (e.g. equipment temporally mounted on multi-purpose carrier vehicles or other machines) may be used in similar applications as above.

Additional equipment for specialized cleaning applications; that may be attached to a sweeper is not covered by this European Standard.

This European Standard elaborates unique symbols for operator controls and other displays as applied to the machines described above and are based on recommendations of ISO/IEC 80416 (all parts).

Most symbols are constructed using a building-block approach in which various symbols and symbol elements may be combined in a logical manner to produce a particular symbol. The creation of composite symbols is unlimited and in some cases an example may be exclusive to a particular machine that has a unique feature, the symbols illustrated in the section devoted to composite symbols only depict examples of some of the more common functions and conditions of machines.

1 Scope

This European Standard applies to surface cleaning machines for outdoor applications in public areas, roads, airports and industrial complexes. Cleaning machines for winter maintenance and/or indoor applications are not included within the scope of this European Standard. Surface cleaning machines in terms of this standard, are self-propelled, truck mounted, attached sweeping equipment or pedestrian controlled as disclosed in EN 15429-1.

Surface cleaning machines by way of their function, have specialized equipment necessary to perform their task.

This European Standard deals with graphical symbols uniquely used to indicate the function and status of operator controls and tell-tale displays of the specialized equipment.

Common symbols that are included in other standards and applied to a wider range of machines are not included. Typically, symbols in this category that may equally be applied to surface cleaning machines can be found in ISO 2575 *Road vehicles – Symbols for controls, indicators and tell-tales*, and ISO 6405 *Earth moving machinery – Symbols for operator and other displays – Part 1: Common Symbols*.

This European Standard does not apply to machines or components that are specifically designed for cleaning tramlines and rail tracks.

Industrial sweepers, within the scope of EN 60335-2-72 are excluded from this European Standard.

This European Standard applies to machines manufactured after the approval date of the standard by CEN.

2 Normative references

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

EN 15429-1, *Sweepers — Part 1: Classification and Terminology*

EN 15429-2, *Sweepers — Part 2: Performance requirements and test methods*

ISO 2575, *Road vehicles — Symbols for controls, indicators and tell-tales*

ISO 6405-1, *Earth-moving machinery — Symbols for operator controls and other displays — Part 1: Common symbols*

ISO 7000, *Graphical symbols for use on equipment — Registered symbols*

IEC 80416-1, *Basic principles for graphical symbols for use on equipment — Part 1: Creation of graphical symbols for registration*

IEC 80416-3, *Basic principles for graphical symbols for use on equipment — Part 3: Guidelines for the application of graphical symbols*

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

ISO 80416-4, *Basic principles for graphical symbols for use on equipment — Part 4: Guidelines for the adaptation of graphical symbols for use on screens and displays (icons)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15429-1 and EN 15429-2 and the following apply.

3.1
symbol
visually perceptible figure/illustration with a particular meaning, if not immediately obvious, is at least readily learnt, used to impart information independently of language, produced by drawing, printing or other means

3.2
base symbol
main element of a symbol showing generally a specific part and/or operational feature of the machine, base symbols may be combined into a composite symbol

3.3
composite symbol
combination of symbols formed into a single symbol to describe associated functions and or a particular condition of the machine parts/elements

3.4
symbol title and description
symbol identified by industry generic names for the machine part with its operational activity being controlled and or indicated described

3.5
icon (digital display icon)
digitized (pixelated) representation of a graphical symbol, usually used on a reconfigurable electronic display screen or graphical user interface (GUI)

Note 1 to entry: A single symbol can be represented by multiple icons, each of a different size, pixel count, or colourisation.

4 General

4.1 Symbols shown in succeeding clauses of this standard that are shown in outline form may be filled-in in actual use for clarity of reproduction and improved visual perception by the operator, except as otherwise noted for individual symbols.

4.2 Limitations inherent in some reproduction and display technologies may require an increased line width or other minor modifications to the symbols. Such modifications are acceptable provided the symbol remains unchanged in its basic graphical form and is easily discernible by the operator.

4.3 If necessary to improve the appearance and perceptibility of a symbol and/or to coordinate with the design of the equipment to which it is applied, the graphical designer is normally free to make changes provided the essential perceptible characteristics of the symbol are maintained, see IEC 80416-1 and IEC 80416-3.

4.4 In use, all symbols shall be reproduced large enough to be easily discernible by the operator. See IEC 80416-3 for guidelines on the proper sizing of symbols. Symbols shall be used in the orientation shown, unless otherwise noted for individual symbols.

4.5 In most cases where a symbol shows a machine or parts of a machine in a side view, a machine moving from right to left in the symbol area shall be assumed. If a symbol shows a machine or parts of a machine in a top (overhead/plan) view, a machine moving from bottom to top in the symbol area shall be assumed.

4.6 Symbols shall be located on, or adjacent to the control or display that is being identified. Where more than one symbol is required for a control, the symbols shall be located in relation to the control such that movement of the control towards the symbol shall realize the function depicted by that symbol.

4.7 Most symbols are constructed using a building-block approach in which various symbols and symbol elements may be combined in a logical manner to produce a particular symbol. Clause 7 illustrates the base symbols associated with surface cleaning machine parts/elements, function and environment, these may be used exclusively, unless specified otherwise. Normally, these are combined into a composite symbol to convey a specific message. Examples of composite symbols are illustrated in Clause 8. Additionally, composite symbols may include arrows and/or ISO/IEE registered symbols from other standards and in particular ISO 2575 and ISO 6405-1. The creation of composite symbols is unlimited and in some cases an example may be exclusive to a particular machine that has a unique feature, the symbols illustrated in Clause 8 only depict examples of some of the more common functions and conditions of machines. Where simple variations are possible, e.g. a mirror image or change of base symbol element, this possibility is disclosed in the description.

4.8 The use of the symbol is given in the Symbol title and description as per IEC 80416-1. In Clause 7 this is indicated for all the listed symbols except 7.20, 7.21 and 7.22. In Clause 8 it shall be assumed that all symbols identify controls for operating modes and indicators except where stated otherwise.

EXAMPLE Composite symbol 8.29 (hopper/body – raised warning); to identify indicators for raised condition.

4.9 In some cases it may be necessary to change the graphical appearance of a base symbol and/or its orientation to indicate a machine function and/or condition.

EXAMPLE Base symbol 7.16 (hopper/body) is shown in Clause 8 modified in many ways to reflect operational functions and/or conditions.

4.10 Symbols representing movement of equipment or machine elements, whether visible or invisible to the operator shall show the final position of the equipment or machine element affected by the operator control together with arrows to indicate the direction of movement.

EXAMPLE Base symbol 7.16 (hopper/body) is shown in Clause 8 in ways to reflect movement together with directional arrows.

4.11 Symbols on controls and displays shall have a good contrast to their background. A light-coloured symbol on a dark-coloured background is preferred for most controls. Displays can use either a light-coloured symbol on a dark-coloured background or a dark-coloured symbol on a light-coloured background, depending upon which alternative provides the best visual perception. When a symbol image is reversed (for example black to white or vice versa), this shall be done for the entire symbol and/or array of symbols except where colouring is used for a particular purpose – see Clause 5.

4.12 Arrows used in symbols shall conform to the requirements of ISO 80416-2. IEC 80416-1 shall be consulted for the general principles for creating symbol originals. IEC 80416-3 advises on the application of symbols on machinery.

4.13 ISO/IEC registration numbers, where relevant to illustrated symbols, are shown in Clause 6 and Clause 7; see ISO 7000.

NOTE Symbol originals are approved and registered by ISO/TC 145/SC 3 and published in ISO 7000. In some cases, modified for particular application symbols, rather than the original symbols are shown in this standard.

4.14 Letters and numerals may be used in symbols. Fonts shown in this standard are not intended to be restrictive; other fonts may be substituted, but care shall be taken to ensure legibility is retained.

NOTE Letters and numerals are not registered by ISO/TC 145/SC 3 or published in ISO 7000.

4.15 Symbols in this standard are presented at 32 % of symbol original size. The grid marks "∟" denote the corners of the 75 mm square of the graphics grid from IEC 80416-1. The grid marks are not part of the symbol.

5 Colour

5.1 When used with illuminated displays, the following colours shall have the meanings indicated:

— red: failure or serious malfunction, requires immediate attention;

— yellow or amber: outside normal operating limits;

— green: normal operating condition.

5.2 In addition, certain colours may also be used for a specific or collective grouping of function/s:

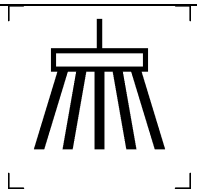
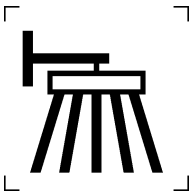
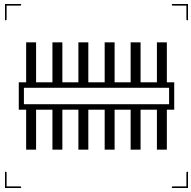
— e.g. red to indicate hot, blue to indicate cold, typically when used in association with water spray functions where hot or cold water is utilized.

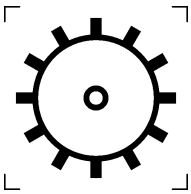
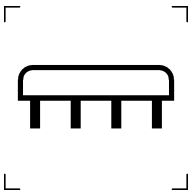
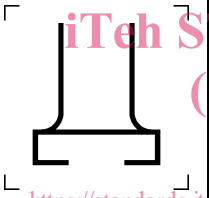
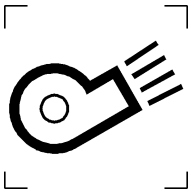
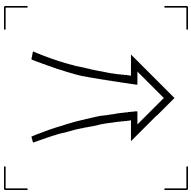
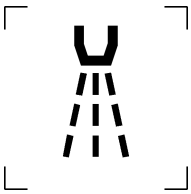
6 Adaption of symbols as digital display icons

Symbols may be adapted for use as digital display icons on reconfigurable or other electronic displays (for example, virtual terminals according to ISO 11783-6). Such adaptations should follow the principles of ISO 80416-4. Special care should be taken to ensure that digital display icons preserve the visual impression of the symbol from which the icon is adapted. The same principles regarding use of colour with symbols apply to the use of colour with digital display icons.

7 Base symbols

Table 1 — Base symbols

Symbol number	Symbol	Symbol title and description	ISO/IEC registration number
7.1		Conical channel/Gutter brush/broom To identify controls for operating modes and indicators.	7000–1237
7.2		Multi-positional brush/broom To identify controls for operating modes and indicators.	None
7.3		Cylindrical roller/Transfer brush/broom To identify controls for operating modes and indicators.	7000–1249

Symbol number	Symbol	Symbol title and description	ISO/IEC registration number
7.4		Cylindrical roller/Pick-up brush/broom To identify controls for operating modes and indicators.	7000–1103
7.5		Scrub brush/broom To identify controls for operating modes and indicators.	7000–1104
7.6		Elevator – dirt transfer To identify controls for operating modes and indicators.	7000–2089
7.7		Dirt pick-up nozzle/head To identify controls for operating modes and indicators. (ISO 7000-1245)	None
7.8		Fan – suction/blaster To identify controls for operating modes and indicators.	7000–1597
7.9		Air - movement/suction/inlet/blaster To identify controls for operating modes and indicators.	7000–1604
7.10		Water - spray/flushing/washing: low pressure To identify controls for operating modes and indicators.	None