SLOVENSKI STANDARD
oSIST prEN IEC 63172:2019

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Metodologija za določanje razredov energijske učinkovitosti električne opreme

Methodology for determining the energy efficiency class of electrical accessories

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COMMITTEE DRAFT FOR VOTE (CDV)

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IEC TC 23 : ELECTRICAL ACCESSORIES	
SECRETARIAT: Belgium	SECRETARY: Mr Wim De Kesel
OF INTEREST TO THE FOLLOWING COMMITTEES: SC 23A,SC 23B,SC 23E,SC 23G,SC 23H,SC 23J,SC 23K,TC 64,TC 121	PROPOSED HORIZONTAL STANDARD: ☒ Other TC/SCs are requested to indicate their interest, if any, in this CDV to the secretary.
FUNCTIONS CONCERNED: ☐ EMC ☒ ENVIRONMENT ☐ QUALITY ASSURANCE ☐ SAFETY	
☒ SUBMITTED FOR CENELEC PARALLEL VOTING **Attention IEC-CENELEC parallel voting** The attention of IEC National Committees, members of CENELEC, is drawn to the fact that this Committee Draft for Vote (CDV) is submitted for parallel voting. The CENELEC members are invited to vote through the CENELEC online voting system.	☐ NOT SUBMITTED FOR CENELEC PARALLEL VOTING

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TITLE:

Methodology for determining the energy efficiency class of electrical accessories

PROPOSED STABILITY DATE: 2022

NOTE FROM TC/SC OFFICERS:

This CDV has been prepared by the convenor of WG9 based on the decision of TC 23 WG 9 taken during it's meeting held in September 2018

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ELECTRICAL ACCESSORIES –

Methodology for determining the Energy Efficiency class of electrical accessories

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This Technical Report IEC TR XXXXX has been prepared by working group 9: Energy Efficiency Aspects in TC23, of IEC technical committee 23: Electrical accessories.

The text of this International Standard is based on the following documents:

FDIS	Report on voting
XX/XX/FDIS	XX/XX/RVD

[JK1]

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

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INTRODUCTION

The electric energy efficiency of homes and buildings is continuously increasing by reducing the electric energy consumption of products. For example, changing from traditional incandescent lighting to LED lighting.

Specific electrical systems and accessories e.g. Home and Building Electronic Systems (HBES) / Building Automation Control Systems (BACS), individual sensors, actors, actuators, dimmers and load shading equipment (LSE) can contribute to additional energy savings.

Additional savings can also be achieved by managing and monitoring electrical energy use, depending on time, occupancy, inputs and needs from the grid.

HBES/BACS contribute to greater energy savings than the energy they consume to perform this task. However, as every watt counts, it is necessary to optimize their own energy consumption for given functionalities.

In the case of devices with more functionality (e.g. multi-channel switch actuators, control boxes,..), this document provides a methodology for determining the energy efficiency class of accessories based on the consumption of each function and their percentage of use. It aims to enable the system designer to determine the most efficient system considering the increasing users request for additional functionalities.

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ELECTRICAL ACCESSORIES –

Methodology for determining the Energy Efficiency class of electrical accessories

1 Scope

This document provides a methodology for determining the energy efficiency class of electrical accessories, to enable the system designer to determine the most efficient components for an electrical installation, also considering all functionalities.

NOTE Functionalities are for example: wireless communication, network connectivity, timer, energy monitoring.

This methodology is based on the energy consumption, taking into account the individual functions of the accessory.

The energy efficiency class approach contributes to the overall reduction of the energy consumption of an electrical installation.

This group EE publication is primarily intended to be used as an EE standard for the products mentioned in the scope, but is also intended to be used by technical committees in the preparation of publications for products similar to those mentioned in the scope of this document, in accordance with the principles laid down in IEC Guide 118 and IEC Guide 119.

2 Normative references

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IEC GUIDE 118:2017, *Inclusion of energy efficiency aspects in electrotechnical publications*

IEC GUIDE 119:2017, *Preparation of energy efficiency publications and the use of basic energy efficiency publications and group energy efficiency publications*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
OFF mode
mode of the accessory having a direct control where the respective electric load is deactivated and is able to be activated by deliberate action on the accessory by the user; in this mode the accessory is consuming no energy.

3.2
standby mode
mode of the accessory having a direct control where the respective electric load is deactivated and is able to be activated by deliberate action to the accessory by the user or the system; in

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this mode the accessory is consuming energy to perform this function. This mode includes an interaction through displays regardless of the state of the electric load.

3.3
ON mode
mode of the accessory having a direct control where the respective electric load is activated and is able to be deactivated by deliberate action to the accessory by the user or the system; in this mode the accessory is consuming energy.

Note 1 to entry: In this mode, the consumed energy can be greater than the energy consumption in the standby mode.

3.4
control mode
mode of the electronic accessory that do not have a direct control where they are connected to loads and performing their functions in such a way that a control signal can be internally generated or an external control signal can be received, by wire or wireless, and processed to lead to a change in the load status.

3.5
direct control
case where the current to the load flows through the accessory

3.6
standby energy consumption
energy consumed by an accessory in the standby mode

3.7
operational energy consumption
energy consumed by an accessory in the ON mode

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3.8
control energy consumption
energy consumed by an accessory for control mode

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3.9
Energy Efficiency Class
EE
numerical value assigned to an electrical accessory according to its energy performance.

4 Description of the methodology

4.1 General

The method consists of different steps to get at the end an energy efficiency class for a device. This method takes the different functions and their different energy consumptions into account as well as the different usage of the functions.

1) Identifying the different functions of a device;
2) Measuring the Energy consumption of the different functions in their different operational modes;
3) Take the different times for the different operational modes into account to get a power consumption which takes the Operational profile for the different functions into account;
4) Determine the associated energy efficiency points for every function;
5) Rescale the energy efficiency points according to the energy consumption for the different functions related to the energy consumption of the whole device;
6) Sum up the rescaled energy efficiency points to get the energy efficiency points for the whole device;
7) Determine the Energy efficiency class using the energy efficiency points of the whole device.

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This method allows extending the energy efficiency tables according the technical development without the need for rescaling.

4.2 Relationship between accessories, their modes and the energy efficiency class relevance

Table 1 shows examples of accessories and the energy efficiency class relevance according to the modes and their type.

Table 1 – Relationship between accessories, their modes and the energy efficiency class (examples)

Accessory	Direct control	OFF mode	Standby mode	Control mode	ON mode	energy efficiency class relevance
Mechanical switch	yes	yes	n.a	no	yes	no [2)]
Mechanical switch with indicator light (indicator parallel to switch)	yes	n.a	yes	no	yes	no [2)]
Mechanical switch with indicator light (indicator parallel to load)	yes	yes	n.a	no	yes	no [2)]
Socket outlet	yes	yes plug not inserted	n.a	no	yes plug inserted	no [2)]
Socket outlet with further function	yes	n.a	yes	no	yes plug inserted	yes
Electronic switch relays (2 wires or 3 wires)	yes	no	yes	no	yes	yes
Dimmers (2 wires or 3 wires)	yes	no	yes	no	yes	yes
Dimmers 3 wires with mechanical switch (load side)	yes	no	yes	no	yes	yes
Dimmers 2 wires with mechanical switch (load side)	yes	yes	n.a	no	yes	no [2)]
Presence/Movement detector	Yes no [1)]	no	n.a	Yes no [1)]	yes	no [2)]
Presence/Movement detector with forced position by mechanical switch	yes	yes	yes	no	yes	yes
Presence/Movement detector forced with position by electronic switch	yes	no	yes	no	yes	yes
HBES switches	yes no [1)]	n.a	yes	Yes no [1)]	yes	yes
LSE	yes	n.a	yes	no	yes	yes

[1)] depending on the design

[2)] due to the fact that these devices have no other functions they shall not be considered for the methodology of this document as they cannot contribute to increase the energy efficiency within a system.

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4.3 Functions embedded in electrical accessories

The modern accessories have been developed incorporating greater functionality to satisfy users request (e.g. comfort and management function) like remote access, monitoring, automatic and easily programmable functions, network connectivity for interaction with Home and Building Electronic Systems (HBES), touch free operation e.g. in hospitals (see Table 2).

Even if more functionalities of the electrical accessories need additional energy these functions are essential to reduce the consumption of a building via for example HBES or BACS controls.

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For example, remote functions of control applications allow the user to switch off loads without being present.

In order to determine the electric energy efficiency class of an accessory it is necessary to analyse the energy consumption of embedded functionalities.

Since energy consumption also implies the time of use of the various functions of the accessory, the general approach of this document is only concerned with power. It cannot take into account the installation and uses of these accessories.

For this approach, these functions need to be separately measured or separately calculated from the manufactures data see Annex A.

The energy efficiency (EE) classes determined by classification of the individual functions of an electrical accessory are given in clause 5.

Examples of functions are given in Table 2.

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