SLOVENSKI STANDARD
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Plavalni bazeni za domačo uporabo - Učinkovitost ravnanja z okoljem - Vrednotenje učinkov, metodologija in klasifikacija uporabe zunanjih bazenov in njihove opreme

Domestic swimming pools - Environmental performance efficiency - Performance evaluation, methodology, and classification of the use of outdoor pools and their equipment

Schwimmbäder für die private Nutzung - Umwelteinfluss von Schwimm-bädern für die private Nutzung - Anforderungen an die Konstruktion und Benutzung, Prüfverfahren und Klassifizierung der Geräte und Funktionen

Piscines privées à usage familial - Efficience des performances environnementales - Évaluation de la performance, méthodologie et classification de l'utilisation des piscines extérieures et de leurs équipements

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Domestic swimming pools - Environmental performance efficiency - Performance evaluation, methodology, and classification of the use of outdoor pools and their equipment

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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 402.

If this draft becomes a European Standard, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (prEN 17645:2021) has been prepared by Technical Committee CEN/TC 402 “Domestic pools & spas”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

Introduction

The majority of our energy is generated by the use of finite global resources. This process is also producing waste products and harmful emissions.

Every product has an impact on the environment during all the stages of its life cycle, such as, for example, the extraction of resources, the acquisition of raw materials, production, distribution, use and end-of-life processing, including final disposal. These impacts range from light to significant, may be short- or long-term, and occur on a global, regional or local scale.

The need to improve the environmental performance efficiency of a product that may occur in all the stages of its life is recognized around the world. The environmental performance efficiency of products can be increased by taking environmental questions into consideration.

There are already many standards, directives, scientific documents, etc. pertaining to the environmental impact and the sustainability of products.

The environmental performance efficiency is assessed according to, amongst other things, principles of honesty, transparency, comparability and completeness, and by taking all the stakeholders into consideration. The requirements applying to functionality, quality, design and suitability which are essential for domestic swimming pools, are important indicators to be taken into account, in addition to considerations related to these environmental performances and their sustainability.

In the light of existing documents (ISO Guide 64, CEN Guide 4, etc.), this is the reason why it seemed necessary to develop a standard covering criteria applying to the environment and sustainability in order to:

— address the environmental performances of domestic swimming pools in order to fill the gap in this field;

— improve the efficiency of the products on the market and encourage the development of energy-efficient and environmentally-friendly products;

— promote good practice in terms of sustainability (energy and water savings, reduction of waste and noise, etc.).

1 Scope

This document specifies the design and use requirements, the test methods and the scales of classification of the environmental performance when using a domestic swimming pool.

This document is applicable to outdoor pools, as defined in EN 16582 (all parts), intended to be permanently installed, and shall be red jointly with the latter.

This document allows the evaluation of the environmental performance efficiency of the use of domestic swimming pools.

NOTE This document only covers the operational phase of the basin. All the other stages of the product life cycle, such as the extraction of resources, the acquisition of raw materials, production, distribution, use and end-of-life processing, including final disposal, are not covered by this document.

This document does not apply to:

— the specific functions of buildings housing domestic indoor swimming pools, such as air treatment or the lighting or insulation of the buildings, etc.;

— domestic spas covered by EN 17125, or their specific equipment;

— spas for public use, or their specific equipment;

— mini-pools covered by EN 16927, or their specific equipment;

— paddling pools covered by EN 71-1 and EN 71-8, or their specific equipment;

— non-permanently installed pools covered by EN 16582 (all parts);

NOTE This document does not cover non-permanently installed pools, because the absolute majority of this kind of pools are not equipped with any kind of heating, operated and used only in comparable short periods (range of 3-4 months), and the power consumption of pumps used are usually low (range of less than 1 kWh per day).

Nevertheless, to ensure a future objective comparison also with this kind of pools and other permanently installed pools, a calculation method for non-permanently installed pools will be established and considered in the next revision.

— swimming pools for public use covered by EN 15288-1, or their specific equipment.

This document also does not apply to:

— personal hygiene devices, such as showers or footbaths, or their specific equipment;

— devices for water features, such as water play equipment or fountains, or their corresponding specific equipment (dedicated pumps, etc.).

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.

EN 16582-1, *Domestic swimming pools — Part 1: General requirements including safety and test methods*

EN 16713-1:2016, *Domestic swimming pools — Water systems — Part 1: Filtration systems — Requirements and test methods*

EN 16713-3:2016, *Domestic swimming pools — Water systems — Part 3: Water treatment — Requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16582-1 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
indoor swimming pool
swimming pool intended for bathing, situated inside a building and covered by a fixed or mobile roof

Note 1 to entry: A basin under a shelter or a cover is not considered to be an indoor pool.

[SOURCE: EN 15288-1:2018, modified]

3.2
outdoor swimming pool
swimming pool in the open air and intended for bathing

[SOURCE: EN 15288-1:2018, modified]

3.3
non-permanently installed pool
swimming pool intended to be temporarily installed (e.g. summer time)

3.4
cover
element for pools designed to cover the water in the pool, floating on or placed above the surface up to the deck level of the pool

3.5
lighting system
system made up of a light and a lamp compatible with the light

Note 1 to entry: Definition taken from regulations EU 1194/2012 and EU 874/2012.

3.6
rated power
value of the electric power in Watts used to specify a lamp and established for a specified set of operating conditions

Note 1 to entry: Definition taken from regulations EU 1194/2012 and EU 874/2012.

3.7
operation of the pool
all the actions required to operate and use the swimming pool, after the basin is filled with water for the first time

3.8
index of solar heat gain
S
capacity of an envelope to transmit the energy from solar radiation to a medium

Note 1 to entry: The index S is expressed in W/m^2.

Note 2 to entry: The higher the index S, the more of said radiation is transmitted by the envelope and the greater the environmental performance efficiency is.

3.9
index of thermal insulation
I
capacity of an envelope to transfer heat from a warm medium to a cold medium by conduction

Note 1 to entry: The index I is expressed in W/m^2.

Note 2 to entry: The higher the index I, the lower the insulating property of the envelope (the more it allows for the transfer of heat loss) and the greater the negative environmental performance efficiency.

3.10
index of thermal loss by evaporation
E
capacity of an envelope to limit heat loss, due to the evaporation of water, from a warm liquid water medium to a colder air medium

Note 1 to entry: The index E is expressed in W/m^2.

Note 2 to entry: The higher the index E, the greater the evaporation and the greater the negative environmental performance efficiency.

3.11
natural thermal balance
NTB
power of thermal phenomena representing the natural capacity to cause a medium separated from another medium by an envelope to naturally loose or gain energy, without any input of heat from a heating device

Note 1 to entry: The natural heat balance is expressed in W/m^2.

Note 2 to entry: The absolute value of the NTB indicates the speed at which heat exchanges (losses and gains) take place. The higher the value, the higher the speed of the exchanges.

Note 3 to entry: The positive or negative value of the NTB indicates whether gains warm up the water in the swimming pool (positive) or whether losses cause the water in the swimming pool to become colder (negative).

3.12
sound power level
L_{WA}
measurement of the total time-averaged sound energy emitted into the air by a source, weighted by a coefficient A and measured in Watts (W) relative to 1 pW, as defined in EN ISO 3744

Note 1 to entry: This value is usually expressed as a weighted sound power level A, L_{WA}, in decibels (dB).

Note 2 to entry: The measurement of the sound power level is independent of the acoustic environment of the machine.

3.13
guaranteed sound power level
value of the sound power level determined according to the requirements stated in this document, including uncertainty due to variations in production and the measurement procedures

3.14
seasonal coefficient of performance
SCOP
overall performance coefficient of the device, representative of the entire designated heating season

[SOURCE: EN 14825:2016, 3.1.65, with notes 1 & 2 withdrawn]

3.15
coefficient of performance
COP
ratio of the heating capacity to the effective power input of the unit, expressed in Watt/Watt

[SOURCE: EN 14511-1:2013, 2.32]

3.16
staged heat pump
heat pump capable of modifying its delivered power by changing the flow rate-volume of the cooling fluid in a series of no more than two stages

[SOURCE: EN 14825, modified]

3.17
variable-capacity heat pump
heat pump capable of modifying its delivered power by changing the flow rate-volume of the cooling fluid in a series of at least three stages

[SOURCE: EN 14825, modified]

3.18
fixed-capacity heat pump
heat pump incapable of modifying its delivered power by changing the flow rate-volume of the cooling fluid

[SOURCE: EN 14825, modified]

3.19
standby mode
status of a powered up electrical device, ready for use and waiting for its main function(s) to be activated by a measured parameter or by the user

Note 1 to entry: Being ready for use may require the associated functions and operations, such as the display, parameter measurement, reception or waiting for data, limited activity of a microcontroller, etc. to be activated.

3.20
stop mode

status of an electrical device whose main function(s) is/are inactive, whether the device is powered up or not, further to deliberate action by the user, and the residual absorbed power of which is below 0.01W

Note 1 to entry: When in stop mode, the main function(s) of the device can only be activated through deliberate action taken by the user.

3.21
active mode
status of an electrical device whose main function(s) is/are being executed

EXAMPLE A heat pump that is heating or cooling, an electrochlorination system that is producing chlorine, a pH regulator that is injecting a pH corrector, etc.

3.22
filtration system
all of the equipment suitable for the volume of water to be filtered, generally consisting of a filtration unit, a return/suction system, a skimmer and, if necessary, hydraulic connections

[SOURCE: EN 16713-1:2016]

3.23
hydraulic connections
couplings, pipes and watertight equipment required for operating water circulation systems

EXAMPLE Hydraulic connections between the different components of a filtration unit or between the filtration unit and the basin.

[SOURCE: EN 16713-1:2016]

3.24
filtration unit
assembly made up of a pump, generally centrifugal, a filter body and one or more filter elements or a mass of granular filtering material which retains the suspended solids from the swimming pool water circulating through it

Note 1 to entry: The pump may be placed before or after the filter.

Note 2 to entry: The filter may be closed or open, out of the water or submerged.

[SOURCE: EN 16713-1:2016]

3.25
solar collector
exchange device exposed to solar radiation, through which the swimming pool water circulates, and in which the solar radiation directly transfers its heat to the water

Note 1 to entry: The device may be connected to the hydraulic filtration circuit of the swimming pool, or installed separately from it.

Note 2 to entry: If the device is connected, the swimming pool pump may be powerful enough to pump the water through the device, or it may be assisted by an auxiliary pump.

3.26
booster pump
pump dedicated to pressure cleaners, design to deliver high pressure with low flow

4 Design, evaluation and operational requirements for swimming pool equipment / functions

4.1 General

4.1.1 Objectives

This document guides manufacturers in the design and evaluation of equipment for domestic swimming pools, in order to improve their environmental performance efficiency. It also enables distributors / installers to promote this same equipment, which is more environmentally virtuous, through a comprehensive evaluation of the basin that allows buyers to compare several solutions, in terms of each equipment item as well as the complete basin.

Manufacturers / installers that do not provide all the environmental performance characteristics required by this document for the type of product concerned, cannot claim to comply with this document.

4.1.2 Electrical consumption of equipment not connected to the mains

4.1.2.1 Battery-powered equipment

The environmental performance efficiency evaluation (absorbed power, electrical consumption, etc.) of battery-powered electrical equipment that is recharged from the mains is to be considered in the same way as a device connected directly to the mains. Only the electrical characteristics of the accumulator(s) are to be taken into consideration to determine the environmental performance efficiency.

4.1.2.2 Renewable self-powered equipment

Electrical equipment powered by standalone and renewable energy sources (not connected to the mains) shall also be taken into consideration, because their environmental performance efficiency from an

energy perspective is more virtuous. On the other hand, their electric power should be considered as zero.

The supply of power to this equipment from a standalone renewable source is indicated by a special pictogram that shall appear in the various communication materials (see Clause 6).

NOTE Only standalone power sources using renewable energies are taken into consideration. Standalone power sources using fuels are excluded.

4.2 Measurement of electric power

4.2.1 Absorbed power in active mode

The electric power absorbed by the equipment concerned is measured using a wattmeter on the mains power supply of the equipment during a phase of maximum absorbed power under stable thermal and functional conditions.

If the equipment is covered by a European reference standard defining specific conditions of absorbed power measurements, these specific conditions should apply.

The designer / manufacturer shall determine and declare the maximum absorbed power with reading the continuous power in a typical complete operating cycle, with all functions activated and, in the configuration, resulting in maximum absorbed power. Transient phenomena, in particular when starting up the equipment, are excluded from the maximum absorbed power cycle to be taken into consideration.

In order to avoid wrong readings or interpretations adapted measurement equipment shall be used, depending on the physical magnitudes and the product technology (eg true RMS for variable speed drive).

The maximum absorbed power in active mode of any additional equipment shall be considered.

Measurements are taken using apparatus with an accuracy classification of at least 1,5.

The announced value is the average of eight of a series of ten measurements lasting at least 10 s, from which the two extremes are eliminated.

The announced value is rounded to 1 % of the measured value.

4.2.2 Absorbed power in standby mode

4.2.2.1 General

Where appropriate, the consumption in standby mode of each electrical equipment item of the basin shall be evaluated by measuring the electric power absorbed by the equipment in this mode.

The electrical equipment concerned may be:

— heating equipment;

— water treatment equipment;

— basin covers;

— lighting;

— filtration pumps (with electronic variators, built-in programmers, etc.);

— control units.

Between the stop and standby modes defined by the manufacturer, the mode in which the electrical consumption is higher shall be taken into consideration in the evaluation of the power in standby mode, according to this document.

No evaluations are made of the energy performance in standby mode and stop mode.

4.2.2.2 Evaluation of power in standby mode

The power absorbed in standby mode is measured in accordance with the provisions of EN 50564.

4.2.2.3 Information for users

The manufacturer shall publish the power absorbed in standby mode, as measured in 4.2.2 (see Clause 5).

4.3 Water consumption

4.3.1 General

This chapter covers the following aspects:

— filling and / or refilling waters;

— the impact of the operation of the pool on water consumption (treatment, backwashing);

— taking into account natural phenomena on water consumption.

To improve environmental performance efficiency on water consumption, it is recommended to use systems that allow to:

— minimize the evaporation phenomenon;

— maximize natural water inputs (e.g. rainwater).

4.3.2 Filling / topping up the basin

The water used to fill the basin shall meet the recommendations in EN 16713-3:2016, 4.2.

Sources other than the public water network may be used (rainwater, well water, etc.), provided that this water has not been polluted by external elements beyond the limits laid down in EN 16713-3:2016, 4.2.

A specific collection system shall be used to collect rainwater properly.

If necessary, the balance of the water (pH, TAC, TH) in the basin should be measured and corrected, if large quantities of rainwater are added.

The pool decks shall be designed so that run-off water does not flow into the basin.

If the basin is equipped with an automatic filling system, the following requirements apply:

— the water inlet shall be equipped with a stop valve, preferably manual, upstream of the automatic filling system, to avoid unnecessary consumption when the basin is not being operated as usual;

— the water inlet shall be equipped with a disconnection function to prevent any water returning from the basin into the mains;

— the automatic filling system shall be regularly tested to make sure that it is in proper working order.

An independent water meter should be installed on the water inlet to monitor the water consumption of the swimming pool (to check for a leaking basin, for example).