

Public swimming pools - Computer vision systems for the detection of drowning accidents in swimming pools - Safety requirements and test methods (ISO 20380:2017)

EESTI STANDARDI EESSÕNA

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EUROPEAN STANDARD

EN ISO 20380

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**Public swimming pools - Computer vision systems for the
detection of drowning accidents in swimming pools -
Safety requirements and test methods (ISO 20380:2017)**

Piscines publiques - Systèmes de vision par ordinateur
pour la détection de noyades en piscines - Exigences de
sécurité et méthodes d'essai (ISO 20380:2017)

Öffentliche Schwimmbäder -
Computererkennungssysteme für das Erkennen von
Ertrinkungsunfällen in Schwimmbädern -
Sicherheitstechnische Anforderungen und
Prüfverfahren (ISO 20380:2017)

This European Standard was approved by CEN on 9 October 2017.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

This document (EN ISO 20380:2017) has been prepared by Technical Committee ISO/TC 83 "Sports and other recreational facilities and equipment" in collaboration with Technical Committee CEN/TC 136 "Sports, playground and other recreational facilities and equipment" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2018, and conflicting national standards shall be withdrawn at the latest by June 2018.

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

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Endorsement notice

The text of ISO 20380:2017 has been approved by CEN as EN ISO 20380:2017 without any modification.

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment*.

Introduction

Currently available epidemiological data show that despite the presence of lifeguards, drowning [which, according to the World Health Organization (WHO), is the process of experiencing respiratory impairment from submersion/immersion in liquid] remains in public swimming pools with entrance fees. A certain number of studies^{[2][11]} together demonstrate that for several reasons (physiological, cognitive, architectural, organizational, etc.), lifeguards may sometimes find themselves in difficulty when watching over swimmers, knowing that a potential risk of a drowning accident may occur.

It is important to bear in mind that a lifeguard can supervise and inform swimmers to help ensure their safety as well as anticipate and intervene early to prevent an accident from occurring.

Computer vision systems do not save people from drowning, as saving a drowning person necessarily requires human intervention.

Installation and use of computer vision systems cannot serve as a reason to reduce human monitoring of swimming pools, unless a robust risk assessment does indicate this is possible without compromising safety, with reference to applicable national regulations, if any.

In addition to the safety organization, these tools are solely for use by a competent person, who received prior training in the operational performances of these systems in accordance with the manufacturers' and the swimming pool operators' instructions.

Not all possible drowning accidents can be detected by the systems described in this document, e.g. persons floating on or just below the water surface. Although the current state-of-the-art does not allow 100 % effectiveness, for several years, these technologies have proved their worth worldwide, by regularly helping lifeguards to identify potential drowning accidents that they had not observed.

While it is possible to retrofit this type of equipment to an existing pool, consideration of its introduction is best at the pool design stage.

In order to really enhance the drowning prevention in swimming pools, computer vision systems are designed to:

- scan continuously and with redundancy the pool basin;
- detect mathematically a solid mass, without trajectory, lying at the pool basin bottom;
- trigger electronically an alarm after the detection;
- limit false alarms by automatically differentiating a solid mass from light and shadow projections on the texture of the pool basin and by discriminating, without human intervention, a motionless solid mass above and below the water surface.

A trained competent person cannot completely rely on such a system because:

- the system has limitations, which are covered in training for using the system;
- the system's performance can be compromised by various factors, which the trained competent person would be informed of automatically in real time.

Computer vision systems are foreseen to support the competent person in detecting drowning accidents at the pool basin bottom and reacting faster by saving precious seconds.

The International Organization for Standardization (ISO) draws attention to the fact that it is claimed that compliance with this document may involve the use of patents concerning computer vision technologies for the detection of drowning accidents in swimming pools, given in [3.1](#).

ISO takes no position concerning the evidence, validity and scope of these patent rights.

The holder of these patent rights has assured ISO that he/she is willing to negotiate licences under reasonable and non-discriminatory terms and conditions with applicants throughout the world. In this

respect, the statement of the holder of these patent rights is registered with ISO. Information may be obtained from:

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Public swimming pools — Computer vision systems for the detection of drowning accidents in swimming pools — Safety requirements and test methods

1 Scope

This document describes the minimum operational, performance and safety requirements and test methods for computer vision systems used to detect drowning accidents.

This document does not apply to the systems used in domestic swimming pools and pool basins with a surface area of less than 150 m².

2 Normative references

There are no normative references in this document.

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:

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

3.1

computer vision system for the detection of drowning accidents

automated system including means for digitizing series of images of people in the *pool basin* (3.11), means for comparing and analysing digitized images and decision means for setting off and sending an *alarm* (3.5) to *trained staff* (3.7) when a *detection* (3.3) occurs

3.2

drowning

process of experiencing respiratory impairment from submersion/immersion in liquid

Note 1 to entry: Outcomes are classified as death, morbidity and no morbidity.

[SOURCE: World Health Organization]

3.3

detection

recognition of a total and prolonged immersion at the bottom of the *pool basin* (3.11) of a stationary solid mass such as a person or object

3.4

monitoring

active and constant observation of people in the *pool basin* (3.11) with the aim of preventing *drowning* (3.2) risks

3.5

alarm

notification by the computer vision system of a *detection* (3.3) to the identified *trained staff* (3.7)