SLOVENSKI STANDARD
SIST EN 1069-1:2017

01-oktober-2017

Nadomešča:
SIST EN 1069-1:2010
SIST EN 1069-1:2010/AC:2012

Vodni tobogani - 1. del: Varnostne zahteve in preskusne metode

Water slides - Part 1: Safety requirements and test methods

Wasserrutschen - Teil 1: Sicherheitstechnische Anforderungen und Prüfverfahren

Toboggans aquatiques - Partie 1: Exigences de sécurité et méthodes d'essai

Ta slovenski standard je istoveten z: **EN 1069-1:2017**

ICS:

97.220.40	Oprema za športe na prostem in vodne športe	Outdoor and water sports equipment

SIST EN 1069-1:2017 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1069-1

August 2017

ICS 97.220.40

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English Version

Water slides - Part 1: Safety requirements and test methods

Toboggans aquatiques - Partie 1: Exigences de sécurité et méthodes d'essai

Wasserrutschen - Teil 1: Sicherheitstechnische Anforderungen und Prüfverfahren

This European Standard was approved by CEN on 14 May 2017.

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

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Contents

European foreword

This document (EN 1069-1:2017) has been prepared by 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of an identical text or by endorsement, at the latest by February 2018, and conflicting national standards shall be withdrawn at the latest by February 2018.

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 supersedes EN 1069-1:2010.

EN 1069, *Water slides*, consists of the following parts:

— *Part 1: Safety requirements and test methods*

— *Part 2: Instructions*

In relation to EN 1069-1:2010 the following main amendments have been made:

a) the document has been editorially revised;

b) the definition water slide (3.3) and water level (3.13) have been revised;

c) requirement for water slide Type 6.2 revised;

d) under 5.6 “Electrical installations” a reference to HD 60364-7-702 has been added;

e) values for Table 1 “Partial factors for Ultimate Limit combinations” and Table 2 “Partial factors for serviceability combinations” have been changed;

f) new Table 3 “Partial factors for combinations of accidental actions” and Table 4 ” Combination factors ψ_0 and ψ_2” have been added;

g) Figure 5 Stepladders for water slide access deleted and requirements for access to water slides (7.5) revised;

h) Figure 6 replaced by Figure 3 of EN 13451-1:2011+A1:2016;

i) an example for calculation has been added to 7.7.3 “Maximum acceleration on a sliding person”;

j) the value for X in Figure 8 “Cross section of Type 1” has been changed;

k) Table 8 “Height of fall and water depth in splashdown area for type 1 and type 2” and Table 9 “Falling distance and water depth in a splashdown area for Types 3, 4, 6, 7, 8, 9 and 10” have been revised;

l) Table 8 has been replaced by a graph (see Figure 15);

m) values for water flow rate in 8.3 “Water flow” have been changed and Clause 8.3 moved to 7.12.2 Water flow rate;

n) Requirements in 9.3.2 “Slide tester” have been changed;

o) Figure A.1 and A.2 have been revised;

p) values for type 4 in Table A.2 “Dimensions of splashdown area for Types 3 and 4” have been changed;

q) values for type 6.2 in Table A.3 “Dimensions of splashdown area for Type 6” have been changed;

r) Annex D is now informative and a subclause on a maximum speed measuring device was added (D.1.3).

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The market for water slides is extremely wide and specific and still developing. It is impossible to define an all-embracing safety specification, including dimensions and design requirements as required by a standard, without limiting the design possibilities and preventing innovative and new but safe products.

This European Standard is intended to establish safety requirements and design guidance rules to serve anyone involved with water slides, especially designers, manufacturers, operators and users, to ensure safe and more efficient products. Its basic approach is the consciousness that the sliding action usually implies for the users a higher risk level than using a pool. For certain aspects of design, manufacturing, installation, operation and use only specific guidelines, without any technical specification, are given, which should be taken into consideration and be fulfilled in order to ensure safety for operators and users.

1 Scope

This European Standard is applicable to all water slides installed in swimming pools of public use.

This Standard specifies general safety requirements for water slides in swimming pools of public use and specific requirements for defined types of water slides. These specific safety requirements are also applicable to undefined types as far as possible.

These requirements concern safety and the technical rules for design, calculation and testing.

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 1069-2:2017, *Water slides — Part 2: Instructions*

EN 1990, *Eurocode - Basis of structural design*

EN 1991-1-1, *Eurocode 1: Actions on structures - Part 1-1: General actions - Densities, self-weight, imposed loads for buildings*

EN 1991-1-3:2003, *Eurocode 1 - Actions on structures - Part 1-3: General actions - Snow loads*

EN 1991-1-4, *Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions*

EN 10088-1, *Stainless steels - Part 1: List of stainless steels*

EN 10088-2, *Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*

EN 10204:2004, *Metallic products - Types of inspection documents*

EN 13451-1:2011+A1:2016, *Swimming pool equipment - Part 1: General safety requirements and test methods*

EN 13451-2, *Swimming pool equipment - Part 2: Additional specific safety requirements and test methods for ladders, stepladders and handle bends*

EN 13451-3, *Swimming pool equipment — Part 3: Additional specific safety requirements and test methods for inlets and outlets and water/air based water leisure features*

EN 15288-1:2008+A1:2010, *Swimming pools - Part 1: Safety requirements for design*

EN 15288-2, *Swimming pools - Part 2: Safety requirements for operation*

EN 22768-1, *General tolerances - Part 1: Tolerances for linear and angular dimensions without individual tolerance indications (ISO 2768-1)*

EN ISO 9606-1, *Qualification testing of welders - Fusion welding - Part 1: Steels (ISO 9606-1)*

EN ISO 13857:2008, *Safety of machinery - Safety distances to prevent hazard zones being reached by upper and lower limbs (ISO 13857:2008)*

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025)*

3 Terms and definitions

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

3.1
pool/swimming pool
facility, with one or more water areas, intended for swimming, leisure or other water-based physical activities

[SOURCE: EN 15288-1:2008+A1:2010, 3.1]

3.2
public use
use of an installation open to everyone or to a defined group of users, not designated solely for the owner's/proprietor's/operator's family and guests independently from paying an entrance fee

[SOURCE: EN 15288-1:2008+A1:2010, 3.5]

Note 1 to entry: Pools serving houses rented for private use are not of public use.

3.3
water slide
piece of equipment or installation with a sliding surface on which the user slides with water as a friction- and/or speed-reducing medium; the user slides freely or with the use of a ride enhancement device

Note 1 to entry: On some water slides the user can also be pushed e.g. by a water stream.

Note 2 to entry: For classification see Clause 4.

3.4
platform
area providing access to the start section

3.5
start section
area where the user enters the slide proper and takes the sliding position

3.6
slide proper
area intended for sliding

3.7
final part
part of the slide proper designed to prepare the user for landing, plus the subsequent parts/areas which allow landing

Note 1 to entry: Subsequent parts can be splashdown area, catch unit, sofa, etc.

3.8
landing
conclusion of sliding action

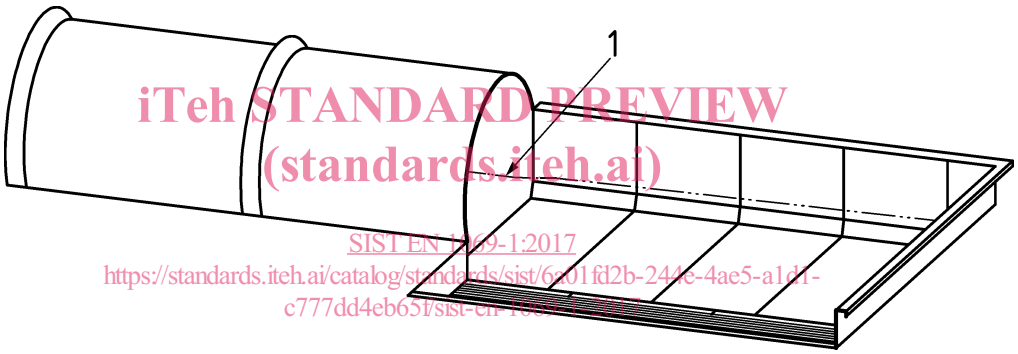
Note 1 to entry: Types of conclusion can be fall, surf landing into water, being slowed down and stopped in a catch unit or sofa.

3.9
surf landing
kind of landing which implies the action of being guided from the end of the final part, independently from its design, to intentionally surf on the water surface of the pool as a design feature

3.10
catch unit
integral part of a water slide, which brings the rider to a halt in his sliding position

Note 1 to entry: See Figure 1.

EXAMPLE



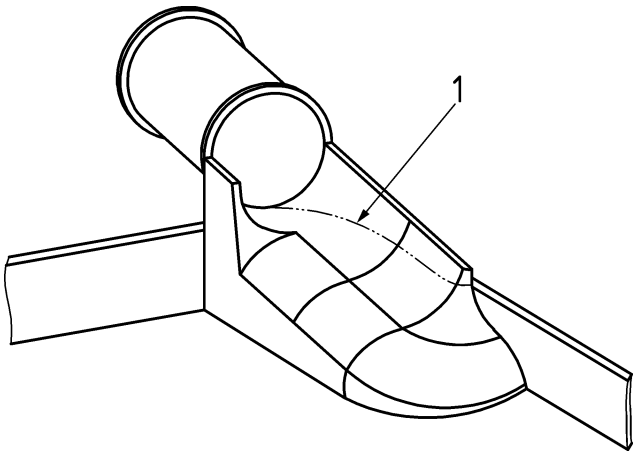
Key
1 water line

Figure 1 — Example of typical catch unit

3.11
sofa unit
integral part of a water slide, which slows down the rider on the sliding surface and moves him additionally sideways out of the sliding path of the following users

Note 1 to entry: See Figure 2.

EXAMPLE



Key
1 water line

Figure 2 — Example of typical sofa unit

3.12
splashdown area
specific pool or area which is part of a general purpose pool, in which the user lands from the end of the slide, and is brought to a halt in the water

3.13
water level
defined operating water surface in the landing area

3.14
drop
section of the slide proper, tilted with an inclination greater than those of adjacent sections

3.15
tube
closed section, not necessarily circular in cross section, of a water slide, with a fully utilisable sliding surface

3.16
cover
device to enclose an open slide, not intended for sliding

3.17
riser
extension for the slide proper, intended for sliding

3.18
wave screen
device, placed within the clearance zone, to control spilling water

3.19
ride enhancement device
device to slide on or in, designed for a particular water slide

3.20
barrier
device to restrict users from falling over, under or through it

3.21
average inclination
inclination *x* in percent (%) calculated with the formula

$$x = \left(h \, x \, 100\right) / l$$

where

h is the height between start section and beginning of final part, in metres;

l is the developed length of the slide proper excluding the final part, in metres

3.22
clearance zone
controlled space around the user on the slide proper and of the final part, designed to prevent the impact of the users with obstacles

4 Classification

4.1 Type 1

4.1.1 Type 1.1

Straight slides for children not exceeding 1,0 m in height from start section to water level and with an average inclination ≤ 70 % may be designed in the form of a single slide or a wide slide (more than one user at the same time).

4.1.2 Type 1.2

Straight single-track slide for children with an average inclination of ≤ 70 % and a height of 1 000 mm < *h* ≤ 3 000 mm from start section to water level.

4.2 Type 2

4.2.1 Type 2.1

Curved single-track slide for children with an average inclination of ≤ 70 % and a height of ≤ 3 000 mm from start section to water level.

4.2.2 Type 2.2

Helical single-track slide for children with an average inclination of ≤ 70 % and a height of ≤ 3 000 mm from start section to water level, where the radius of the slide is constant and in the same direction.

4.3 Type 3

Single-track slide, with an average inclination of maximum 13 %, excluding the final part. The average speed of the users shall be ≤ 5 m/s. The maximum speed of the users shall be ≤ 8 m/s.

4.4 Type 4

Speed single-track slide with an average inclination between 13 % and 20 %, excluding the final part. The average speed of the users shall be ≤ 10 m/s. The maximum speed of the users shall be ≤ 14 m/s.

4.5 Type 5

High-speed single-track slide with an average inclination of at least 20 %, excluding the final part. The maximum speed of the users may be > 14 m/s.

4.6 Type 6

4.6.1 Type 6.1

Multi-track slide with separate parallel tracks (straight or curved), with an average inclination of maximum 13 %, one beside the other over the full length. The average speed of the users shall be ≤ 5 m/s. The maximum speed of the users shall be ≤ 8 m/s.

4.6.2 Type 6.2

Multi-track slide with separate parallel tracks (straight or curved), with an average inclination of between 13 % and 25 %, excluding the final part. The average speed of the users shall be ≤ 10 m/s. The maximum speed of the users shall be ≤ 14 m/s.

4.7 Type 7

Wide straight slide with a maximum inclination of 35 %, not exceeding 8 m in height above water level and 7,7 m above the ground. The maximum speed of the users shall be ≤ 8 m/s.

4.8 Type 8

Single-track slide with longitudinal descending and ascending gradients where the user also slides upwards, sometimes helped by a jet of water or by a specific device.

4.9 Type 9

Wide, straight, single-track slide providing a free transversal oscillating sliding path while sliding in direction to the end of the slide. The maximum speed of the users shall be ≤ 14 m/s.

4.10 Type 10

A combination slide where the user exits from a slide of another type into a circular bowl and descends in a spiral path, before either free falling through a hole at the bottom into the splashdown area, or entering an additional slide.

5 Materials and construction

5.1 General

Any material may be used for the construction of water slides, supports and ride enhancement devices, provided that it fulfils the requirements of this standard.

5.2 Selection of materials

All materials and finishes used shall be:

a) suitable for the selected use, the respective surroundings and conditions;

b) in accordance with the relevant standards/regulations;

c) able to withstand conditions of high humidity with occasional saturation and/or corrosiveness;

d) not encouraging the growth of bacteria.

The use of stressed stainless steel which could be subjected to stress corrosion shall be avoided, unless it can be inspected and regularly cleaned. Where stainless steel is used, the grade used shall be in accordance with Annex B.

The materials shall not contain substances which are assigned the following Risk-phrase at concentrations exceeding 0,1 % (see Regulation (EU) Nr. 1272/2008):

— N317 may cause an allergic skin reaction.

5.3 Certificates

Certificates for safety critical building materials (e.g. load bearing materials) shall:

— be in accordance with the relevant standards/regulations;

— comply at least with EN 10204:2004, test report “Type 2.2”.

5.4 Manufacturer and installer

The manufacturer and the installer shall ensure that persons engaged in the construction and the installation of the water slide are competent to carry out the work, and that welders are suitably qualified and accepted according to EN ISO 9606-1. Any assembling, modification, adjustment or alteration of parts shall only be done by persons with appropriate experience and skills.

5.5 Durability

The designer shall specify the method of protection or frequency of inspection. All components shall be protected to minimize degradation caused by corrosion or rot by an approved method. The quality of protection shall depend on the use of the components. Where hollow section structural steel is used, internal corrosion shall be considered.

5.6 Electrical installations

The relevant national and European regulations for electrical installations in and at buildings (e.g. swimming pool, swimming pool surround) apply.

NOTE See HD 60364–7-702.