BS EN 1069-2:2010

BSI Standards Publication

Water slides

Part 2: Instructions

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

raising standards worldwide™

Full document details: BS EN 1069-2:2010

National foreword

This British Standard is the UK implementation of EN 1069-2:2010. It supersedes BS EN 1069-2:2000 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee SW/136, Sports, playground and other recreational equipment.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

© BSI 2010

ISBN 978 0 580 62909 9

ICS 97.220.40

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2010.

Amendments issued since publication

Date	Text affected

Documents
Document Sharing Hub

Full document details: BS EN 1069-2:2010

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 1069-2

August 2010

ICS 97.220.40

Supersedes EN 1069-2:1999

English Version

Water slides - Part 2: Instructions

Toboggans aquatiques - Partie 2: Instructions

Wasserutschen - Teil 2: Hinweise

This European Standard was approved by CEN on 16 July 2010.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

© 2010 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN 1069-2:2010: E

Documents
Document Sharing Hub

Full document details: BS EN 1069-2:2010

Contents

Page

Foreword 3
Introduction 4
1 Scope 5
2 Normative references 5
3 Terms and definitions 5
4 Operation 6
5 Instructions for users 8
6 Documentation 11
7 Maintenance instructions 11
8 Inspections 13
9 Commissioning 14
10 Quality of Water 14
Annex A (normative) **Safety and information signs for water slides** 15
Annex B (informative) **Example of the risk assessment** 24
Bibliography 40

Documents
Document Sharing Hub

Full document details: BS EN 1069-2:2010

Foreword

This document (EN 1069-2:2010) 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 2011, and conflicting national standards shall be withdrawn at the latest by August 2011.

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 1069-2:1999.

EN 1069, *Water slides*, consists of:

— *Part 1: Safety requirements and test methods*

— *Part 2: Instructions*

In relation to EN 1069-2:1999 the following main amendments have been made:

a) title and scope have been modified to include all water slides;

b) new definitions have been added;

c) requirements for the operation have been amended, now recalls EN 15288-2 and requires a risk assessment as a basis to determine the operational guidelines about risk reduction, proper supervision, technical operation, emergency instruction (see Clause 4);

d) requirements for the instruction for use have been amended (see Clause 5). The type of signage is now consistent with valid ISO/TC 145 standards and 5.2 "Signage at the entrance of a slide" is more detailed;

e) all graphical symbols for signage have been redesigned complying with valid ISO/TC 145 standards, and moved to a normative Annex A;

f) requirements for maintenance instruction has been amended (see Clause 7);

g) Clause 8 "Inspections" was added;

h) Annex B (informative) was added, providing examples for risk assessments.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

AVA Documents
Document Sharing Hub

Full document details: BS EN 1069-2:2010

Introduction

The provision of water slide installations is increasing, also are the concerns over the number of injuries resulting from the use of water slides, many of which are of a serious nature.

Many of the injuries have resulted from foreseeable circumstances and, given proper knowledge and control, could have been prevented.

A standard or a code of practice for instructions and the operation of water slides is seen as the most appropriate way to achieve an improvement in safety.

Documents
Document Sharing Hub

Full document details: BS EN 1069-2:2010

1 Scope

This European Standard is applicable to water slides as defined in EN 1069-1:2010, 3.3.

This European Standard establishes the instructions for use, operation and maintenance as well as the documentation and commissioning of water slides.

2 Normative references

The following referenced documents are indispensable for the application 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 1069-1:2010, *Water slides — Part 1: Safety requirements and test methods*

EN 1418:1997, *Welding personnel — Approval testing of welding operators for fusion welding and resistance weld setters for fully mechanized and automatic welding of metallic materials*

EN 15288-1, *Swimming pools — Part 1: Safety requirements for design*

EN 15288-2:2008, *Swimming pools — Part 2: Safety requirements for operation*

EN ISO 3834 (all parts), *Quality requirements for fusion welding of metallic materials (ISO 3834:2005)*

EN ISO 13849-1, *Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design (ISO 13849-1:2006)*

EN ISO 15607, *Specification and qualification of welding procedures for metallic materials — General rules (ISO 15607:2003)*

ISO 3864-1, *Graphical symbols — Safety colours and safety signs — Part 1: Design principles for safety signs in workplaces and public areas*

ISO 3864-3, *Graphical symbols — Safety colours and safety signs — Part 3: Design principles for graphical symbols for use in safety signs*

ISO 7001, *Graphical symbols — Public information symbols*

ISO 7010:2003, *Graphical symbols — Safety colours and safety signs — Safety signs used in workplaces and public areas*

ISO 20712-1, *Water safety signs and beach safety flags — Part 1: Specifications for water safety signs used in workplaces and public areas*

ISO 20712-3:2008, *Water safety signs and beach safety flags — Part 3: Guidance for use*

ISO 22727, *Graphical symbols — Creation and design of public information symbols — Requirements*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1069-1:2010 and the following apply.

3.1
operator
company, organization, authority or person with overall control and responsibility for the water slide facility

AVA Documents
Document Sharing Hub
Full document details: BS EN 1069-2:2010

3.2
platform
area providing access to the start section

3.3
raft
type of ride enhancement device for one or more users

4 Operation

4.1 General

EN 15288-2 applies and EN 15288-1 shall be considered if appropriate. The following subclauses give specific advice related to water slides.

4.2 Guidelines to the operational risk assessment

An operational risk assessment shall be performed by the slide operator, based on the results of the design risk assessment, as a basis for the identification of the proper supervision, following the requirements of EN 15288-2. In addition, and referring to the fact that impact between the users proved to be a critical issue, also the following risks shall be taken into consideration:

a) inappropriate spacing at the start between users;

b) sliding position (e.g. sitting) can bring the user to an involuntary stop;

c) significant differences in speed can cause collisions of users;

d) significant differences in speed caused by:

   1) different sliding positions;

   2) different bathing costume respectively wearing hardly any bathing costume (e.g. G-string type);

   3) different fitness, size, weight and age of user;

   4) changing water flow rate (malfunction of water supply);

e) reasonably foreseeable risky behaviours by the users:

   1) higher risk of collision between users at a splashdown area in contrast to a catch unit;

f) suitability for children;

g) foreseeable users categories (e.g. adults, children, both) and number of users (e.g. chain sliding allowed);

h) allowed use of ride enhancement devices (e.g. mattresses, rafts).

Examples of general and specific risk assessments are given in Annex B.

4.3 Risk reduction

The operator shall take measures to reduce possible risks to a minimum bearing in mind the risky behaviours of users by choosing an appropriate level of distance control and supervision and shall identify a risk reduction strategy from the following options:

Documents
Document Sharing Hub
Full document details: BS EN 1069-2:2010

a) permanent full supervision by the staff at the start section and at the splashdown area/catch unit, staff is in communication with each other;

b) adequate technical distance control, e.g. turnstiles at the entrance and/or exit area and/or a traffic light control at the entrance;

c) a proper level of supervision/technical measures as a result of the risk assessment.

Additional safety equipments which may be used:

d) For the user: The installation of a monitor at the start section that transmits the situation at the end of the slide and at the catch unit/splashdown area for the person who is starting to see whether the catch unit or the splashdown area of the pool is free.

e) For the supervisory staff: The installation of a monitor at the staff terminal that transmits the situation at the start and the end of the slide and at the catch unit/splashdown area. The quality of technical distance control equipment depends on the risk assessment and should be carried out in accordance with EN ISO 13849-2.

4.4 Basic elements for the identification of proper supervision

The operator, by performing the part of the risk assessment concerning proper supervision, shall take into account at least the following:

a) kind of landing:

   1) catch unit;

   2) sofa unit;

   3) special pool and its water depth at landing;

   4) general purpose pool and its water depth at landing;

b) speed at the final part;

c) presence and kind of distance control:

   1) full technical distance control;

   2) traffic lights;

   3) other types;

d) visibility for the user:

   1) slide fully visible from the start;

   2) catch unit visible from the start;

   3) pool visible from the start.

The use of mandatory and prohibition signs and public information symbols should also be considered when determining the proper supervision to enforce them.

Documents
Document Sharing Hub
Full document details: BS EN 1069-2:2010

4.5 Technical operation

Written guidelines shall be produced concerning operational instructions by the operator paying particular attention to operational safety aspects (e.g. starting procedure, sliding speed of the users – see EN 1069-1:2010, 7.13).

These instructions shall comprise:

— detailed explanation of the controls and their function;

— recommended user access and egress procedures, exclusively allowed sliding positions and any limitations necessary to prevent static overload of the water slide;

— the prescribed limiting conditions stating any limitations for user, the limits of speed of operation, the sliding time and the maximum numbers of user to be carried;

— emergency evacuation procedures;

— any environmental limitations, e.g. conditions of wind, rain, snow during which the water slide shall not be operated;

— details of the maintenance, service or repairs, qualification of the maintenance staff and specification about selection of proper spare parts.

4.6 Emergency instructions

Written guidelines for emergency situations shall be produced for competent staff by the operator in association with the statutory authorities.

4.7 Incident logbook

All incidents, including accidents, occurring with the use of a slide shall be recorded, monitored and analysed regularly to ensure that the necessary improvement of the design, operation or maintenance of the slide are made in order to prevent accidents as far as possible in future.

5 Instructions for users

5.1 Planning and use of signage

It is the responsibility of the manufacturer to define and notify/supply the proper signage at the time of commissioning. Based on the results of the risk assessment the operator shall identify and install any possible additional signage pertinent to the safe use and operation of the specific water slide. Where safety signs are required they shall be designed in accordance with ISO 3864-1 and ISO 3864-3, and safety signs from ISO 20712-1 and ISO 7010 used when applicable.

In addition to any relevant graphical symbols from ISO 20712-1, ISO 7010 and ISO 7001, a list of safety signs and information signs related to use of water slides is presented in Annex A. Relevant graphical symbols shall be assembled on multiple signs, see ISO 20712-3. Public information symbols shall be designed in accordance with ISO 22727 and public information symbols from ISO 7001 used when applicable.

A written supplementary text, in the language(s) of the country where the slide is installed shall be added possibly with translation into other language(s). The minimum supplementary text is shown below each graphical symbol (see figures in Annex A). The minimum text height of upper case letters shall be 15 mm.

New graphical symbols additional to those given in this standard shall be designed in accordance with ISO 3864-1 and ISO 3864-3 for safety signs, and ISO 22727 for public information symbols. The graphical symbols should be tested for comprehension according to ISO 9186-1. If the comprehension score does not

AVA Documents
Document Sharing Hub
Full document details: BS EN 1069-2:2010

meet the criteria for acceptance set for ISO 7010 or ISO 7001 as relevant, the graphical symbol shall be accompanied by supplementary text.

5.2 Signage at the entrance of a slide

The graphical symbols required to be included in the signage system shall include all those determined as a result of the risk assessment.

From slide Type 1.2 onwards minimum signage shall be clearly displayed at the entrance of the means of access and on the platform, complying with the template given in Figure 1.

In addition, where more than one slide starts from the same platform, specific information for each slide shall be displayed before entering its start section.

The following minimum required safety signs and public information symbols shall be displayed on the multiple sign:

a) the severity of the ride, by using the designated information sign and using the following colour code:

   1) blue for easy (Types 2, 3, 6.1 where relevant);

   2) red for medium (Types 4, 6.2, 7, 8, 9 and 10 where relevant);

   3) black for severe (Types 5 and 10 where relevant);

b) minimum height/age of the user and additionally for Types 1 and 2 maximum height/age of the user;

c) height of fall landing, if > 200 mm;

d) water depth in the splashdown area;

e) instructions to clear quickly the landing area after the ride;

f) the only mandatory sliding position or, if more that one position is allowed, the relevant information signs;

g) the mandatory use of ride enhancement devices (e.g. single or multiple rafts, mattresses).

It is the responsibility of the manufacturer to define the above mentioned information and requirements to display them at the time of commissioning.

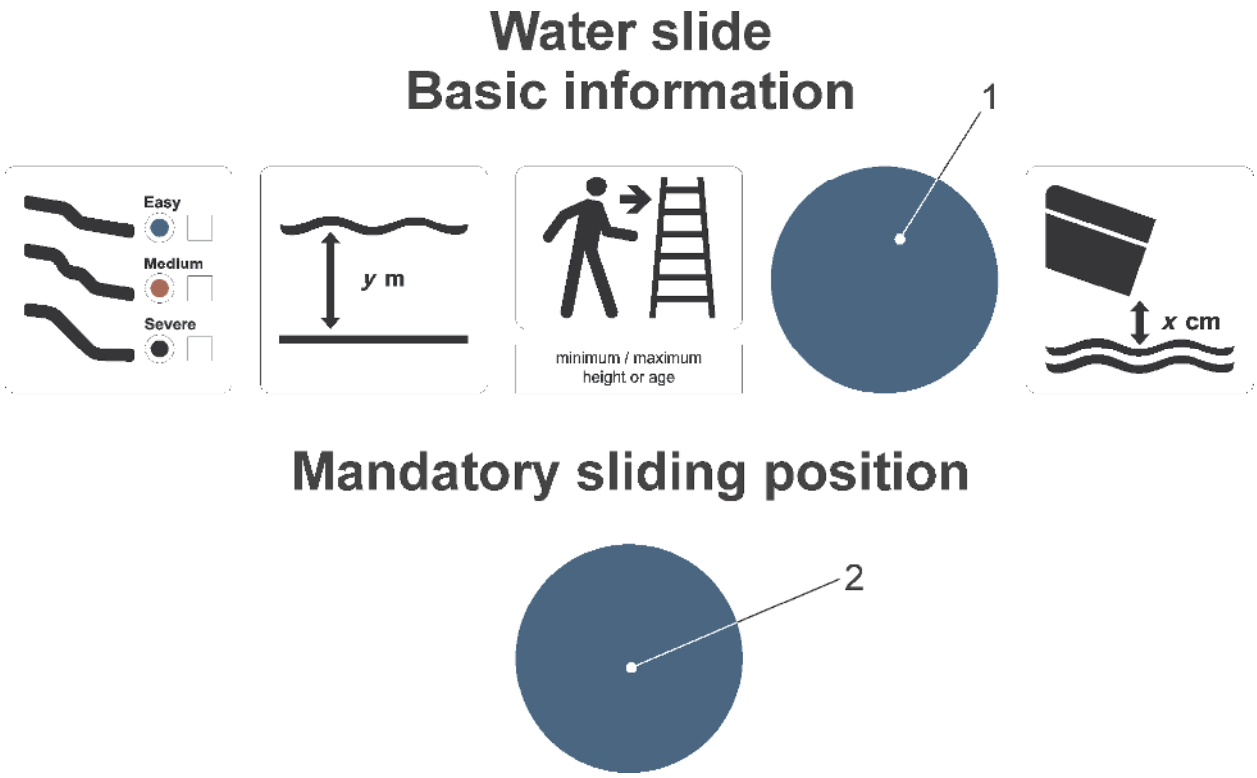
If a special feature has been incorporated in the design, e.g. the possibility of becoming involuntary airborne, special water/light/sound effects, then the user shall be warned at least prior to use the slide.

The information shall be given that young children up to the age of eight years should always be supervised by parents or responsible carers, see EN 15288-2:2008, 6.1.1.3.

Conforming to the result of the operational risk assessment (see EN 15288-2) the operator may add, under his responsibility, more information/warnings/prohibitions/mandatory signs or alter those given by the manufacturer, except a), paying attention to the possibility to reach all users categories in the specific environment.

Figure 1 gives the template about how to combine the information that needs to be displayed, using the defined graphical symbols.

Documents
Document Sharing Hub
Full document details: BS EN 1069-2:2010



Key

1 either Figure A.13 or Figure A.14 shall be inserted.
2 the relevant figures of the sliding position shall be inserted (see Annex A).

Figure 1 — Template of minimum signage to be displayed at the entrance of a slide

If more than one sliding position may be allowed at one water slide, change the heading into "Allowed sliding positions" and insert those signs which describe the positions in form of an information sign according to ISO 7001 (see Figure A.6 to Figure A.11). More than one mandatory action sign in this case is not allowed.

NOTE It is advisable to show allowed and recommended behaviours instead of prohibited ones.

5.3 Additional user information

The instructions for use shall address possible additional hazards in accordance with the risk assessment, including e.g.:

— medical conditions of the users;

— jewellery and spectacles worn by the users;

— locker keys/bracelets worn by the users;

— voluntary stopping along the slide;

— possible misunderstanding of the displayed signs.

For information to be effectively imparted to user's signs inside the changing areas or inside lockers may be used e.g. about removing jewellery and spectacles. Complex safety messages and vital information concerning the severity/difficulty of the water slide may also be given through video clips shown on screens at the point of payment and in the changing room. This would help the user make an informed decision about his willingness to use a specific slide.

Documents
Document Sharing Hub
Full document details: BS EN 1069-2:2010

6 Documentation

Each manufacturer/supplier/importer/installer shall provide for the following information, at the time of commissioning:

a) manufacturer's/supplier's complete address, web address, telephone number, and a manual to enable the operator to request instructions or assistance. Special advice or details of special qualifications for personnel shall be given where appropriate;

b) all safety relevant design documents as built drawings and calculations of the complete water slide installation and parts list; documentation of foundation, durability, design analysis and inspection, certificates of manufacturing, materials, components, test reports, electric circuit diagrams. The results of the various inspections shall also become an integral part of the logbook;

c) technical data and other important technical characteristics;

d) detailed maintenance and technical operational program relating to the water slide as installed;

e) if delivered in the area of application of EN 1069-1 and EN 1069-2 this manual shall be written in the language of the user and shall provide, as a minimum, the instructions specified in Clause 7;

f) the results of the design risk assessment and every other requirement/information relating to 4.2 and concerning manner of use (e.g. position, use of raft, numbers, etc.).

7 Maintenance instructions

7.1 General

Maintenance instructions for slides and accessories as given by the manufacturer/supplier shall be followed under the responsibility of the operator.

Frequency of maintenance if not regulated by statutory requirements or manufacturers instructions shall be at least once a year.

Maintenance, repair and modification shall be recorded, in a maintenance logbook, and monitored by the operator.

These instructions shall comprise:

— lifespan;

— a list of those components (e.g. joints, surfaces) which require regular inspection, the recommended frequency of inspection (preferably expressed in service hours), and the method of inspection, e.g. visual;

— a list of any specific tests to be carried out;

— recommendations regarding electrical maintenance;

— requirements for cleaning and maintenance particular of stressed stainless steel and GRP (glass-reinforced plastics);

— recommendations regarding removing deposits from the slide itself, e.g. calcium, body fats.

Whether contracted or not, all maintenance work on a water slide shall be carried out by, or under the direct supervision of persons trained or experienced in the maintenance procedures.

Documents
Document Sharing Hub
Full document details: BS EN 1069-2:2010

These procedures shall include preventive maintenance and component monitoring, taking into account any instructions from, or consultation with, the manufacturer and the independent inspection body. All guards, fences, equipment enclosures and access doors, which are removed for servicing or maintenance purposes, shall be replaced and effectively secured in position before operation.

Safety signs may need to be displayed during any of the operations (see ISO 7010 for relevant safety signs).

7.2 Servicing

The servicing intervals recommended by the manufacturer shall not be exceeded, unless any extension in the period has been agreed and approved either with the manufacturer in writing or with the approval of the independent inspection body.

The frequencies at which servicing is carried out shall be in compliance with manufacturer's recommendations.

Servicing recommendations shall deal with all components that have to be checked, tested, adjusted or replaced at specified intervals.

7.3 Repair

The repair of damaged parts shall be carried out with caution, as this could lead to an alteration of the approved original design. For example, the stiffening or strengthening of one component can produce higher stresses in adjacent components which, in turn, fail. Welding shall follow the provisions in standards EN ISO 15607, EN ISO 3834 (all parts), etc. Welding may be a safety-critical modification, requiring approval by the manufacturer and inspection body. A welder shall follow the appropriate European Standards and shall be qualified to EN 1418:1997, Clause 6 and shall use the correct materials and techniques. Changes of this kind shall be regarded as modifications and dealt with in the manner specified below.

7.4 Modifications

Any modification to:

— structures and mechanical parts;

— safety critical components;

— emergency equipment;

— performances

shall only be carried out after consultation with the manufacturer and/or the independent inspection body.

Following any such modification, those parts involved, shall be subjected to further thorough inspection by an independent inspection body and update of the risk assessment before the water slide is taken back into use. The approved documentation shall be included in the logbook.

Even apparently insignificant modifications may lead to the accelerated failure of the components of a device, and using a device outside the manufacturer’s specification or the specific environment for which it was designed, is a safety-critical modification.

The inspection report concerning a repair or modification shall be included in the logbook.

Documents
Document Sharing Hub

Full document details: BS EN 1069-2:2010