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BSI Standards Publication

Sports and other recreational facilities and equipment — Injury and safety definitions and thresholds — Guidelines for their inclusion in standards

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National foreword

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Installations et équipement de sport et autres activités de loisirs — Seuil et définitions des dommages et sécurité — Lignes directrices pour leur inclusion dans les normes

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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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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 83, *Sports and other recreational facilities and equipment*.

Introduction

Products need to be safely constructed, produced, and maintained covering a reasonable foreseeable misuse/intended use evaluated by the manufacturer. Any areas of risk have to be defined and precautions taken. Nevertheless, the use of the equipment or activities with this equipment on sports or playgrounds will create a residual risk related to the individual user. This has to be evaluated by a risk assessment and reduced to an acceptable or tolerable risk of performance. The result of this evaluation may deviate by age and social grouping.

TECHNICAL REPORT **ISO/TR 20183:2015(E)**

Sports and other recreational facilities and equipment — Injury and safety definitions and thresholds — Guidelines for their inclusion in standards

1 Scope

This Technical Report provides standards writers with guidelines for the inclusion of injury and safety definitions and thresholds to be applied in the development of ISO/TC 83 standards. It is intended to contribute to harmonization of the language and understanding safety of products/procedures as well as to comply with Directive 2001/95/EC on general product safety requirements.

2 Terms and definitions

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

2.1
safe
state of being protected from recognized hazards that are likely to cause harm

2.2
safety
freedom from unacceptable risk, but not *safe* (2.1)

Note 1 to entry: Safety is achieved by reducing risk to a tolerable level.

Note 2 to entry: There is no complete absence of risk. In turn, there is no product or system that is without some risk which shall be reduced to a *tolerable risk* (2.8).

2.3
risk
combination of the probability of occurrence of harm and the severity of that harm

Note 1 to entry: The probability of occurrence includes the exposure to a *hazardous situation* (2.7), the occurrence of a *hazardous event* (2.6), and the possibility to limit the harm.

2.4
harm
injury or damage to the health of people or damage to property or the environment

2.5
hazard
potential source of *harm* (2.4)

2.6
hazardous event
event to result in *harm* (2.4)

2.7
hazardous situation
circumstances in which people, property or the environment are exposed to one or more hazards

2.8
tolerable risk
acceptable risk
risk (2.3) which is acceptable in a given context based on the current values of society

Note 1 to entry: The terms “acceptable risk” and “tolerable risk” are synonymous.

2.9
risk reduction measure
protective measure
any action or means of eliminating *hazards* (2.5) or reducing *risk* (2.3)

Note 1 to entry: Risk reduction measures or protective measure could include, but are not limited to, eliminating hazards, guarding against hazards, use of *protective devices* (2.22), and reducing the likelihood of *hazardous events* (2.6).

2.10
residual risk
remaining *risk* (2.3) after *risk reduction measures* or *protective measures* (2.9) have been taken

Note 1 to entry: Following risk reduction measures, the residual risk should be less than *tolerable risk* (2.8), thus providing *safety* (2.2).

2.11
risk analysis
systematic use of available information to identify *hazards* (2.5) and to eliminate *risk* (2.3)

2.12
risk evaluation
procedure based on the *risk analysis* (2.11) to determine whether a *tolerable risk* (2.8) has been achieved

2.13
risk assessment
overall process comprising a *risk analysis* (2.11) and *risk evaluation* (2.12)

Note 1 to entry: Degree of exposure to danger or *harm* (2.4) comprised of the potential severity of the harm and the probability of that harm occurring. In determining the probability of occurrence of harm, the exposure of a *user* (2.16) to a *hazardous situation* (2.7), the possibility of a *hazardous event* (2.6), and the potential means of limiting the harm should all be considered.

2.14
intended use
use of a product or system in accordance with the information provided by the supplier

2.15
reasonably foreseeable misuse
use of a product or system in a manner not intended by the supplier where that manner of use could be anticipated based on predictable human behaviour

Note 1 to entry: Also referred to as “foreseeable misuse”.

Note 2 to entry: In evaluating readily predictable human behaviour, all relevant demographics should be considered, including, but not limited to elderly, children, and persons with disabilities.

Note 3 to entry: In the context of consumer safety, ”reasonably foreseeable use” is often used to encompass both “*intended use*” (2.14) and “reasonably foreseeable misuse”.

2.16
user
ultimate user of a product or service

Note 1 to entry: For a child under the age of consent, the user may be a parent, legal guardian, or qualified caregiver.

2.17
inspection
act of identifying *hazards* (2.5) or *hazardous situations* (2.7)

Note 1 to entry: Inspection should include, but not be limited to consideration of hazards that can emerge during or as a result of intended operation, *reasonably foreseeable misuse* (2.15), vandalism, aging of the product/environment, and weather conditions.

2.18
manufacturer
party responsible for the design or fabrication of a portion or all of a product intended for a consumer

2.19
installer
assembler
party responsible for assembly and or installation of a product to its final configuration intended by the manufacture and destined for use by a consumer

Note 1 to entry: The installer makes the product ready to use, brings it into the market, and has the same responsibility as the *manufacturer* (2.18). He may even combine several products to a system and acts on behalf of the manufacturer.

2.20
operator
person(s) or organization(s) which allows a product to be used

Note 1 to entry: Operator may implement an active role of running a product like a rope course, a merry-go-round, or a summer-sledge.

2.21
owner
person(s) or organization(s) which has legal title to the product to be used

Note 1 to entry: The owner may also be the *operator* (2.20).

2.22
protective device
apparatus such as a guard that blocks, shields, or otherwise prevents access to a *hazard* (2.5) or reduces the degree of *harm* (2.4) that can be caused by a hazard

Note 1 to entry: A protective device may be a technical device such as a railing.

2.23
personal protective equipment
protective device (2.22) to be worn such as safety glasses or a helmet

2.24
sharp edge
exposed or accessible edge of an element that presents a laceration hazard or other unreasonable risk of injury

Note 1 to entry: The accessibility of the edge, and thus the potential for injury, should be considered for normal use and *reasonably foreseeable misuse* (2.15).

2.25
sharp point
exposed or accessible point of an element that presents a puncture or laceration hazard or other unreasonable risk of injury

Note 1 to entry: The accessibility of the point, and thus the potential for injury, should be considered for normal use and *reasonably foreseeable misuse* (2.15).

2.26
entrapment
type of *hazard* (2.5) where a body, part of a body, clothing, or other element on or attached to a person can become entrapped, caught, or drawn-in resulting in the potential for injury

Note 1 to entry: The possible consequences and resulting *harm* (2.4) of the entrapment depend in part upon the environment. For example, an underwater entrapment could result in drowning or a head entrapment in a playground could result in strangulation.

2.27
entanglement
type of *hazard* (2.5) where a body, part of a body, clothing, or other element on or attached to a person can become caught, entwined, or otherwise entangled resulting in the potential for injury

Note 1 to entry: The possible consequences and resulting *harm* (2.4) of entanglement depend in part upon the environment. For example, an underwater entrapment could result in drowning or at elevation strangulation could be a consequence.

2.28
graduated challenge
event in sport and recreation confronting the *users* (2.16) with activities to test their physical, mental, emotional, or social skills and to achieve a given intended outcome

Note 1 to entry: Based on the ability of the user, there could be circumstances where a user is presented with *hazards* (2.5) that shall be eliminated or reduced for the intended user group and unintended users should be warned away. The user group can be identified by age or ability within the appropriate standard.

2.29
user information
instructions, warning labels, or other written documentation provided by the *manufacturer* (2.18) regarding use and maintenance requirements for the product as well as issues of potential *residual risk* (2.10) that could be related to aging of the product or skill of the *user* (2.16)

Note 1 to entry: This documentation shall be provided by the manufacturer prior to purchase, installation, or acquisition of the product by the *owner* (2.21) and/or *operator* (2.20). The documentation should be available to the user prior to initial use.

Note 2 to entry: Information must be provided in a clear and understandable language and where provided as pictogram or signage, this must be clearly visible and understandable by the user.

2.30
warning
notice or communication to indicate a potentially *hazardous situation* (2.7) that if not avoided, may result in *risk* (2.3)

Note 1 to entry: The TG recommends adding an informative Annex or a general guide spelling out or referring to the principles of *risk assessment* (2.13) as per International Standards. The *risk evaluation* (2.12) to determine the *residual risk* (2.10) can be based on best practice tools like.

2.31
as low as reasonably practical
ALARP
determine the level of *residual risk* (2.10) after steps of hazard reduction have taken place

Note 1 to entry: For the *risk* (2.3) to be ALARP, it must be possible to demonstrate that the cost involved in reducing the risk further would be grossly disproportionate to the benefit gained.

Note 2 to entry: The ALARP principle arises from the fact that infinite time, effort, and money could be spent on the attempt of reducing a risk to zero. It should be understood as simply a quantitative measure of benefit against detriment. It is more a best practice of judgement of the balance of risk and societal benefit.

2.32
traffic light method
results of a *risk assessment* (2.13) or exposure to *hazard* (2.5) may be expressed using a traditional traffic light

2.32.1
red
death or long-term injury, not to be accepted, fundamental improvement is required

2.32.2
yellow
serious injury (2.35) to be expected, improvements to be required

2.32.3
green
no or minor injury is anticipated for the intended user group, no improvements required, ready for service

Note 1 to entry: The following key factors may be used for evaluation.

2.33
life-threatening injury
injury to any part of the human body which is severe or resulting in permanent impairment that would be categorized as *abbreviated injury scale (AIS)* (2.37.1) of 4 (severe with survival probable) or greater

2.34
debilitating injury
injury that diminishes or weakens the human body and has a legacy of greater than one month and that could be categorized as *abbreviate injury scale (AIS)* (2.37.1) of 3 (serious, but not life-threatening)

Note 1 to entry: Debilitating injuries would include requiring surgery concussions that require removal from play to medical attention.

2.35
serious injury
acute physical injury requiring medical or surgical treatment or under the supervision of a qualified doctor or nurse provided in a hospital or clinic and includes injuries such as burns, factures, lacerations, internal injury, injury to organ, concussion, internal bleeding, etc.

Note 1 to entry: All evaluations have to be considered in the light of the appropriate age of the *user* (2.16).

2.36
age appropriate
when selecting a product or equipment, it is important to know the age range of the persons, especially children who will use the product or equipment, as they will have various levels of skill, size, abilities, and development

Note 1 to entry: A rough scale or age grouping may be 0–2, 2–5, 5–12, 12–14, 14–19, and may be governed nationally according to structure of schooling.

Note 2 to entry: The writing of standards and the elimination of *hazards* (2.5) must have an evaluation system based on injuries. To this end, a universal injury evaluation system both for injury reporting and scoping in standards will benefit all involved. The *risk evaluation* (2.12) is based on scoring systems which may vary by country. It may be considered whether those tools should be part of the standards written by ISO/TC 83. This threshold for injury would be acceptable in the scoping of national standards to ensure universality for elimination of hazards and risk evaluation. They may be mentioned in an informative Annex or listed as reference.

2.37 Medical thresholds and diagnostic tools

2.37.1
abbreviated injury scale
AIS
numerical rating for quantifying the severity of injury to a human based on body region, anatomic structure, level of injury, and injury severity that must be used in the scope of standards intended for *safety* (2.2) or injury prevention

Note 1 to entry: The range of severity is from 1-9.

Table 1 — Abbreviated injury scale (AIS)

Injury severity	Abbreviated injury score
Minor injury	1
Moderate injury	2
Serious, but not life-threatening	3
Severe, potentially life-threatening, but survival likely	4
Critical with uncertain survival	5
Unsurvivable injury (maximum possible)	6
Severity unknown	9

Note 2 to entry: The AIS system also considers the following:

— different parts of the body: 1 head, 2 face, 3 neck, 4 thorax, 5 abdomen, 6 spine, 7 upper extremities, 8 lower extremity, and 9 unspecified;

— the type of anatomic structure: 1 whole area, 2 vessels, 3 nerves, 4 organs (including muscles and ligaments), 5 skeletal (including joints), and 6 loss of consciousness;

— head only or the entire body.

3 Summary

3.1 Injury prevention thresholds for scope of standards

The scope of ISO/TC 83 calls for both product safety and promotion of trade and to this end, the user of the products in the standards should be able to rely on credible standards to ensure them that claims of compliance to a standard will effectively protect them from hazards and harm within the context of acceptable risk. The scopes of standards must clearly state the harm and risk to which the consumer and user of a product is exposed.

The provision of definitions and thresholds are only valuable if they are used in the development of standards and used particularly in the scope of standards intended to prevent injury. The prevention statement of the scope shall assist the manufacturers, test houses, and legislators in understanding the intent of the standards writers and specify the limitations related to prevention of injury.

The definitions and a carefully defined scope must, by extension, focus the standards writers in their deliberations and development of those performance standards.

It must be noted that using thresholds, terms, and definitions is not intended to reduce the challenge or enjoyment of a sport or recreation activity, but to raise the awareness of the need to accept risk while working to avoid and limit risks in the context of reasonably foreseeable misuse.

This has and will continue to be a collaborative effort and should assist the sub-committees under ISO/TC 83 and hopefully, National and European Standard Bodies with similar scope as of ISO/TC 83 to consider the need to harmonize terms and standards to assist ISO/TC 83 in promoting international trade within the context of injury and risk prevention.

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