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Cycles — Safety requirements for bicycles —

Part 1: **Vocabulary**

Cycles — Exigences de sécurité pour les bicyclettes —

Partie 1: Vocabulaire

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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 of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 149, *Cycles*, Subcommittee SC 1, *Cycles and major sub-assemblies*.

This second edition cancels and replaces the first edition (ISO 4210-1:2014), which has been technically revised, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 333, *Cycles*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

The main changes are as follows:

— the configuration of Clause 3 was systematically changed;

— some corrections according to ISO/IEC Directives Part 2 were done;

— the definitions of "racing bicycle" and "crank assembly" were modified;

— the following terms and definitions: “handlebar grips portion”, “rigid, non-welded fork”, “sag”, “wheel and tyre assembly”, “crank assembly”, “dropper seat-post”, “seat mast cap” and “suspension dropper seat-post” were added.

A list of all parts in the ISO 4210 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document has been developed in response to demand throughout the world, and the aim has been to ensure that bicycles manufactured in conformity with this document will be as safe as is practically possible. The tests have been designed to ensure the strength and durability of individual parts as well as of the bicycle as a whole, demanding high quality throughout and consideration of safety aspects from the design stage onwards.

The scope has been limited to safety considerations and has specifically avoided standardization of components.

If the bicycle should be used on public roads, national regulations apply.

Cycles — Safety requirements for bicycles —

Part 1: Vocabulary

1 Scope

This document specifies terms and definitions related to safety and performance requirements for the design, assembly, and testing of bicycles and sub-assemblies having maximum saddle height 635 mm or more.

This document does not apply to specialized types of bicycle such as delivery bicycles, recumbent bicycles, tandems, BMX bicycles, and bicycles designed and equipped for use in severe applications such as sanctioned competition events, stunting, or aerobatic manoeuvres.

NOTE For bicycles with a maximum saddle height of 435 mm or less, see national regulations for ride-on toys, and with a maximum saddle height of more than 435 mm and less than 635 mm, see ISO 8098[1].

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 https://www.iso.org/obp

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

3.1 Bicycle type

3.1.1
bicycle
two-wheeled vehicle that is propelled solely or mainly by the muscular energy of the person on that vehicle, in particular by means of pedals

3.1.2
city and trekking bicycle
bicycle (3.1.1) designed for use on *public roads* (3.3.3) primarily for means of transportation or leisure

3.1.3
delivery bicycle
bicycle (3.1.1) designed for the primary purpose of carrying goods

3.1.4
folding bicycle
bicycle (3.1.1) designed to fold into a compact form, facilitating transport and storage

3.1.5
mountain bicycle
bicycle (3.1.1) designed for use off-road on rough terrain, on *public roads* (3.3.3), and on *public pathways* (3.3.2), equipped with a suitably strengthened frame and other components, and, typically, with wide-section tyres with coarse tread patterns and a wide range of transmission gears

3.1.6
racing bicycle
bicycle (3.1.1) intended for high-speed amateur use on *public roads* (3.3.3) and having a steering assembly with multiple grip positions (allowing for an aerodynamic posture, such as drop bars or aerodynamic bars), a multi-speed transmission system, and a maximum mass of 12 kg for the *fully assembled bicycle* (3.2.5)

3.1.7
recumbent bicycle
bicycle (3.1.1) that places the rider in a laid-back reclining position

3.1.8
tandem
bicycle (3.1.1) with saddles for two or more riders, one behind the other

3.1.9
young adult bicycle
bicycle (3.1.1) designed for use on *public roads* (3.3.3) by a young adult whose mass is less than 40 kg, with *maximum saddle height* (3.2.6) of 635 mm or more and less than 750 mm

3.2 General terms

3.2.1
bolted joint
components joined together with threaded fasteners

3.2.2
composite material
component that is entirely or partially made of a non-metallic matrix material which is reinforced by metallic or non-metallic materials such as short or long fibres, fabric, or particles

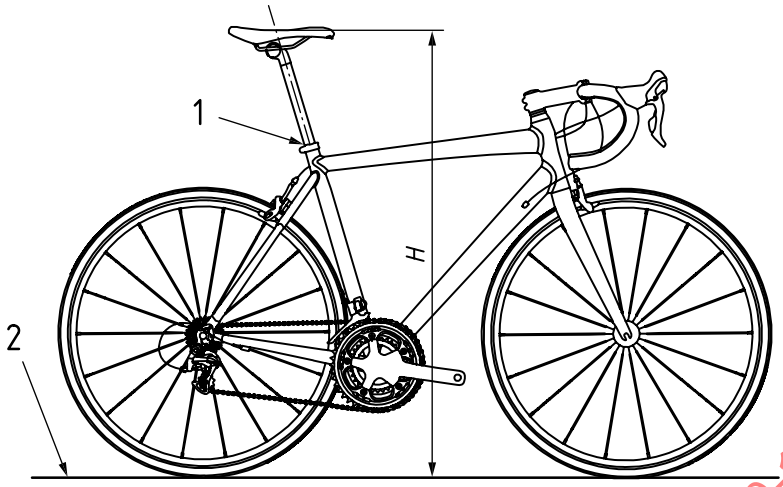
3.2.3
exposed protrusion
protrusion which, through its location and rigidity, could present a hazard to the rider either through heavy contact with it in normal use or should the rider fall onto it in an accident

3.2.4
fracture
unintentional separation into two or more parts

3.2.5
fully assembled bicycle
bicycle (3.1.1) fitted with all components necessary for its intended use

3.2.6
maximum saddle height
vertical distance from the ground to the point where the top of the seat surface is intersected by the seat-post axis, measured with the seat in a horizontal position and with the seat-post set to the *minimum insertion-depth mark* (3.2.7)

Note 1 to entry: See Figure 1.



Key

1 minimum insertion-depth mark

2 ground plane

H maximum saddle height

Figure 1 — Maximum saddle height

3.2.7
minimum insertion-depth mark
mark indicating the minimum insertion-depth of handlebar stem into *fork steerer* (*fork stem*) (3.5.3) or seat-post into frame

3.2.8
quick-release device
lever actuated mechanism that connects, retains, or secures a wheel or any other component

3.2.9
screw thread locking devices
device attached or applied to the threads of a nut or bolt, so that they do not unintentionally become unlocked

EXAMPLE Lock washers, lock nuts, thread locking compound, or stiff nuts.

3.2.10
simulated ground plane
plane used to orient a test part or assembly in a way that represents the cycle's alignment to the ground in a fully assembled cycle

3.2.11
visible crack
crack which results from a test, wherein that crack is visible to the naked eye

3.2.12
wheelbase
distance between the axes of the front and rear wheels of an unladen *bicycle* (3.1.1)

3.3 Driving environment

3.3.1
off-road rough terrain
coarse pebble tracks, forest trails, and other general off-road tracks where tree roots and rocks are likely to be encountered

3.3.2
public pathway
designated and adopted road, path, or track on which a *bicycle* (3.1.1) is legally permitted to travel where motorized traffic is excluded

3.3.3
public road
designated and adopted road, pavement, path, or track on which a *bicycle* (3.1.1) is legally permitted to travel and, on most though not all such public roads, *bicycles* (3.1.1) will share use with other forms of transport including motorized traffic

3.4 Brake

3.4.1
band brake
brake in which a circumferential band is wrapped around the exterior of a cylindrical drum which is attached to or incorporated in the wheel hub

3.4.2
brake lever
lever that operates a braking device

3.4.3
braking distance
distance travelled by a *bicycle* (3.1.1) between the *commencement of braking* (3.4.5) and the point at which the *bicycle* (3.1.1) comes to rest

3.4.4
braking force
F_{Br}
tangential rearward force between the tyre and the ground, or the tyre and the drum or belt of the test machine

3.4.5
commencement of braking
point on the test track or test machine at which the brake-actuating device operated directly by the rider's hand or foot or by a test mechanism starts to move from its rest position

Note 1 to entry: On the test track, this point is determined by the first brake-actuating device (front or rear) to operate.

3.4.6
disc brake
brake in which pads are used to grip the lateral faces of a thin disc attached to or incorporated in the wheel hub

3.4.7
hub brake
brake which acts directly on the wheel hub

3.4.8
rim-brake
brake in which brake shoes act on the rim of the wheel

3.5 Head assembly

3.5.1
aerodynamic extension
extension (or extensions) secured to the handlebar or stem, to improve the rider's aerodynamic posture

3.5.2
bar end
extension secured to the end of a handlebar to provide an additional hand grip and usually with its axis perpendicular to the axis of the end of the handlebar

3.5.3
fork steerer
fork stem
part of a fork that rotates about the steering axis of a *bicycle* (3.1.1) frame head tube

Note 1 to entry: It is normally connected to the fork crown or directly to the fork legs and is normally the point of connection between the fork and the handlebar stem.

3.5.4
handlebar grips portion
section of the handlebar, from *bar end* (3.5.2) to the centre of handlebar, which maintains the same diameter as the *bar end* (3.5.2)

3.6 Frame and fork

3.6.1
dummy fork
test fork manufactured to specific characteristics which can be substituted within a test for either the fork supplied by the manufacturer or where a fork has not been supplied

3.6.2
rigid, non-welded fork
front fork with a non-telescoping structure, where the blades and/or the *fork steerer* (3.5.3) are secured in the fork-crown by press fitting, clamping, adhesives, or any method other than brazing or welding

3.6.3
sag
compression of the suspension to the manufacturer's recommended specification

3.6.4
suspension fork
front fork incorporating controlled, axial flexibility to reduce the transmission of road shocks to the rider

3.6.5
suspension frame
frame incorporating controlled, vertical flexibility to reduce the transmission of road shocks to the rider

3.7 Wheel and rim

3.7.1
composite wheels
wheel assembly containing any *composite material* (3.2.2)

3.7.2
hub generator
electric generating device built in the wheel hub

3.7.3
maximum inflation pressure
maximum tyre pressure recommended by the tyre or rim manufacturer for a safe and efficient performance

Note 1 to entry: If the rim and tyre both indicate a maximum inflation pressure, the maximum inflation pressure is the lower of the two pressures indicated.

3.7.4
primary retention system
system that keeps the front/rear wheel securely attached to the frame/fork dropouts while riding

3.7.5
secondary retention system
system that retains the front wheel in the fork dropouts when the *primary retention system* (3.7.4) is in the open (unlocked) position

3.7.6
wheel
assembly or combination of hub, spokes or disc, and rim, but excluding the tyre assembly

3.7.7
wheel and tyre assembly
assembled *wheel* (3.7.6) fitted with tyre and wheel including all necessary parts for its intended use

3.8 Pedal and drive system

3.8.1
clipless pedal
pedal that contains a device for the attachment of a rider's foot/shoe that can be released by foot movement alone

3.8.2
crank assembly
assembly consisting of the drive side and the non-drive side crank arm, the bottom-bracket spindle or crank spindle, and all component of the drive system that are affixed to the crankset

EXAMPLE The chain-wheel set.

3.8.3
drive belt
seamless ring belt which is used as a means of transmitting motive force

3.8.4
highest gear
gear ratio which gives the greatest distance travelled for one rotation of the cranks

3.8.5
lowest gear
gear ratio which gives the shortest distance travelled for one rotation of the cranks

3.8.6
tread surface
surface of a pedal that is presented to the underside of the foot

3.8.7
pulley
rotating wheel mounted on an axle that contains, around its circumference, teeth or grooves over which a belt can pass to transmit power

3.8.8
toe clip
device attached to the pedal to grip the toe end of the rider's shoe but permitting withdrawal of the shoe

3.9 Saddle and seat-post

3.9.1
dropper seat-post
seat-post (3.9.4) that can be raised or lowered independently of the seat tube clamp while riding

3.9.2
rigid seat-post
seat-post (3.9.4) that cannot be raised or lowered independently of the seat tube clamp, while riding, and does not provide controlled axial flexibility to reduce the transmission of road shocks to the rider

3.9.3
seat mast cap
adjustable clamp assembly to hold the saddle that slides over and attaches to the frame seat mast, which is an extension of the seat tube above the top tube

3.9.4
seat-post
component that clamps the saddle (with a bolt or assembly) and connects it with the frame

3.9.5
suspension dropper seat-post
seat-post (3.9.4) incorporating controlled, axial flexibility to reduce the transmission of road shocks to the rider and incorporating the capability of raising and lowering independently of the seat tube clamp while riding

3.9.6
suspension seat-post
seat-post (3.9.4) incorporating controlled, axial flexibility to reduce the transmission of road shocks to the rider

Bibliography

[1] ISO 8098, *Cycles — Safety requirements for bicycles for young children*