
**Cycles — Safety requirements for
bicycles —**

**Part 1:
Vocabulary**

Cycles — Exigences de sécurité pour les bicyclettes —

Partie 1: Vocabulaire

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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.

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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

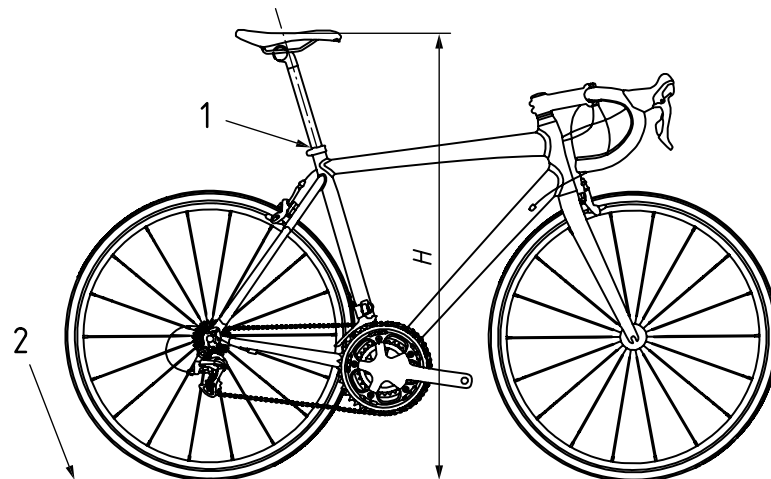
bicycle (3.1.1) fitted with all components necessary for its intended use

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*

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