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# Cycles — Safety requirements for bicycles —

## Part 1: Terms and definitions

*Cycles — Exigences de sécurité des bicyclettes —*

*Partie 1: Termes et définitions*



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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](http://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](http://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 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 149, *Cycles*, Subcommittee SC 1, *Cycles and major sub-assemblies*.

This first edition of ISO 4210-1, together with ISO 4210-2, ISO 4210-3, ISO 4210-4, ISO 4210-5, ISO 4210-6, ISO 4210-7, ISO 4210-8, and ISO 4210-9, cancels and replaces ISO 4210:1996, which has been technically revised.

ISO 4210 consists of the following parts, under the general title *Cycles — Safety requirements for bicycles*:

- *Part 1: Terms and definitions*
- *Part 2: Requirements for city and trekking, young adult, mountain and racing bicycles*
- *Part 3: Common test methods*
- *Part 4: Braking test methods*
- *Part 5: Steering test methods*
- *Part 6: Frame and fork test methods*
- *Part 7: Wheels and rim test methods*
- *Part 8: Pedals and drive system test methods*
- *Part 9: Saddles and seat-post test methods*

## Introduction

This International Standard has been developed in response to demand throughout the world, and the aim has been to ensure that bicycles manufactured in compliance with this International Standard 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 is to be used on public roads, national regulations apply.

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# Cycles — Safety requirements for bicycles —

## Part 1: Terms and definitions

### 1 Scope

This part of ISO 4210 specifies terms and definitions related to safety and performance requirements for the design, assembly, and testing of bicycles and sub-assemblies having saddle height as given in [Table 1](#).

This part of ISO 4210 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 ISO 8124-1, and with a maximum saddle height of more than 435 mm and less than 635 mm, see ISO 8098.

**Table 1 — Maximum saddle height**

Dimensions in millimetres

| Bicycle type          | City and trekking bicycles | Young adult bicycles          | Mountain bicycles | Racing bicycles |
|-----------------------|----------------------------|-------------------------------|-------------------|-----------------|
| Maximum saddle height | 635 or more                | 635 or more and less than 750 | 635 or more       | 635 or more     |

### 2 Terms and definitions

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

#### 2.1

##### **aerodynamic extension**

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

#### 2.2

##### **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

#### 2.3

##### **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

#### 2.4

##### **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

**2.5**

**bolted joint**

components joined together with threaded fasteners

**2.6**

**brake lever**

lever that operates a braking device

**2.7**

**braking distance**

distance travelled by a bicycle between the *commencement of braking* (2.10) and the point at which the bicycle comes to rest

**2.8**

**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

**2.9**

**city and trekking bicycle**

bicycle designed for use on public roads primarily for means of transportation or leisure

**2.10**

**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.

**2.11**

**composite material**

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

**2.12**

**composite wheels**

wheel assembly containing any composite material

**2.13**

**crank assembly**

assembly for fatigue testing consisting of the drive side and the non-drive side crank arm, the pedal-spindle adaptors, the bottom-bracket spindle, and the first component of the drive system

EXAMPLE The chain-wheel set.

**2.14**

**delivery bicycle**

bicycle designed for the primary purpose of carrying goods

**2.15**

**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

**2.16**

**drive belt**

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

**2.17****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

**2.18****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

**2.19****folding bicycle**

bicycle designed to fold into a compact form, facilitating transport and storage

**2.20****fracture**

unintentional separation into two or more parts

**2.21****fork steerer (fork stem)**

part of a fork that rotates about the steering axis of a bicycle 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.

**2.22****fully assembled bicycle**

bicycle fitted with all components necessary for its intended use

**2.23****highest gear**

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

**2.24****hub brake**

brake which acts directly on the wheel hub

**2.25****hub generator**

electric generating device built in the wheel hub

**2.26****lowest gear**

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

**2.27****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.

**2.28****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

**2.29**

**minimum insertion-depth mark**

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

**2.30**

**mountain bicycle**

bicycle designed for use off-road on rough terrain, on public roads, and on public pathways, 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

**2.31**

**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

**2.32**

**pedal tread surface**

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

**2.33**

**primary retention system**

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

**2.34**

**public pathway**

any designated and adopted road, path, or track on which a bicycle is legally permitted to travel where motorized traffic is excluded

**2.35**

**public road**

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

**2.36**

**pulley**

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

**2.37**

**quick-release device**

lever actuated mechanism that connects, retains, or secures a wheel or any other component

**2.38**

**quick-release pedal (clip-less pedal)**

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

**2.39**

**racing bicycle**

bicycle intended for high-speed amateur use on public roads and having a steering assembly with multiple grip positions (allowing for an aerodynamic posture), a multi-speed transmission system, tyre width not greater than 28 mm, and a maximum mass of 12 kg for the fully assembled bicycle

**2.40**

**recumbent bicycle**

bicycle that places the rider in a laid-back reclining position

**2.41****rim-brake**

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

**2.42****screw thread locking devices**

devices 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.

**2.43****seat-post**

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

**2.44****secondary retention system**

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

**2.45****simulated ground plane**

plane used to orient a test part or assembly in a way that represents the cycles alignment to the ground in a fully assembled cycle

**2.46****suspension fork**

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

**2.47****suspension frame**

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

**2.48****tandem**

bicycle with saddles for two or more riders, one behind the other

**2.49****toe clip**

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

**2.50****visible crack**

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

**2.51****wheel**

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

**2.52****wheelbase**

distance between the axes of the front and rear wheels of an unladen bicycle

**2.53****young adult bicycle**

bicycle designed for use on public roads by a young adult whose weight is less than 40 kg, with maximum saddle height of 635 mm or more and less than 750 mm