

---

---

**Cycles — Safety requirements for  
bicycles —**

**Part 6:  
Frame and fork test methods**

*Cycles — Exigences de sécurité pour les bicyclettes —  
Partie 6: Méthodes d'essai du cadre et de la fourche*



This document is a preview generated by ELS



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

	Page
<b>Foreword</b> .....	<b>iv</b>
<b>Introduction</b> .....	<b>v</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Frame test methods</b> .....	<b>1</b>
4.1 Frame — Impact test (falling mass).....	1
4.1.1 General.....	1
4.1.2 Test method.....	2
4.2 Frame and front fork assembly — Impact test (falling frame).....	4
4.2.1 General.....	4
4.2.2 Test method.....	4
4.3 Frame — Fatigue test with pedalling forces.....	6
4.3.1 General.....	6
4.3.2 Test method.....	6
4.4 Frame — Fatigue test with horizontal forces.....	8
4.4.1 General.....	8
4.4.2 Test method.....	9
4.5 Frame — Fatigue test with a vertical force.....	9
4.5.1 General.....	9
4.5.2 Test method.....	10
4.6 Rear brake mount tests.....	11
4.6.1 General.....	11
4.6.2 Static rear brake torque test.....	11
4.6.3 Rear brake mount fatigue test.....	12
<b>5 Fork test methods</b> .....	<b>14</b>
5.1 Suspension forks — Tyre-clearance test.....	14
5.2 Front fork — Tensile test.....	14
5.2.1 Test method — Suspension fork.....	14
5.2.2 Test method — Rigid, non-welded fork.....	14
5.3 Front fork — Static bending test.....	14
5.4 Front fork — Rearward impact test.....	15
5.4.1 Test method 1.....	15
5.4.2 Test method 2 (only for forks made entirely of metal).....	17
5.4.3 Test method 3.....	17
5.5 Front fork — Bending fatigue test and rearward impact test.....	18
5.6 Forks intended for use with hub or disc brakes.....	19
5.6.1 General.....	19
5.6.2 Fork for hub/disc brake — Static brake-torque test.....	19
5.6.3 Fork for hub brake — Brake mount fatigue test.....	22
5.6.4 Fork made of composite materials designed for disc brakes.....	23
5.7 Fork steerer tube and stem assembly — Fatigue test.....	24
5.7.1 General.....	24
5.7.2 Test method.....	24
<b>Annex A (informative) Dummy fork characteristics</b> .....	<b>26</b>
<b>Annex B (normative) Fork mounting fixture</b> .....	<b>28</b>
<b>Annex C (informative) Suspension frames — Tyre-clearance test</b> .....	<b>29</b>

## 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 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](http://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*, 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).

This third edition cancels and replaces the second edition (ISO 4210-6:2015), which has been technically revised.

The main changes are as follows:

- improvement of [4.3](#);
- improvement of [4.4](#);
- improvement of [4.5](#);
- addition of [4.6](#);
- improvement of [5.4](#);
- improvement of [5.6](#);
- change of test equipment for [5.6](#);
- addition of [5.7](#).

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](http://www.iso.org/members.html).

This corrected version of ISO 4210-6:2023 incorporates the following correction:

- [Figure 1](#) has been corrected.

## 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 6: Frame and fork test methods

### 1 Scope

This document specifies the frame and fork test methods for ISO 4210-2.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 4210-1, *Cycles — Safety requirements for bicycles — Part 1: Vocabulary*

ISO 4210-2:2023, *Cycles — Safety requirements for bicycles — Part 2: Requirements for city and trekking, young adult, mountain and racing bicycles*

ISO 4210-3:2023, *Cycles — Safety requirements for bicycles — Part 3: Common test methods*

ISO 4210-5:2023, *Cycles — Safety requirements for bicycles — Part 5: Steering test methods*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4210-1 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/>

### 4 Frame test methods

#### 4.1 Frame — Impact test (falling mass)

##### 4.1.1 General

Manufacturers of frames are permitted to conduct the test with a dummy fork (see [Annex A](#)) fitted in place of a front fork.

Where a frame is convertible for male and female riders by the removal of a bar, test it with the bar removed.

Where a suspension fork is fitted, test the assembly with the fork extended to its unloaded free length. Where a rear suspension system is incorporated in the frame, secure the suspension in a position equivalent to that which would occur with an 80 kg rider seated on the bicycle. For young adult bicycles, secure the suspension in a position equivalent to that which would occur with a 40 kg rider seated on the bicycle; if the type of suspension system does not permit it to be locked, then replace the spring/