

First edition
2014-07-01

Corrected version
2015-02-01

**Cycles — Safety requirements for
bicycles —**

**Part 5:
Steering test methods**

Cycles — Exigences de sécurité des bicyclettes —

Partie 5: Méthodes d'essai de guidage
iTeh STANDARD PREVIEW
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ISO 4210-5:2014

<https://standards.iteh.ai/catalog/standards/sist/dd529a09-8057-483f-a8f3-7d8222c5db81/iso-4210-5-2014>



Reference number
ISO 4210-5:2014(E)

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Published in Switzerland

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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 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 4210-5, together with ISO 4210-1, ISO 4210-2, ISO 4210-3, ISO 4210-4, 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 rims test methods*
- *Part 8: Pedals and drive system test methods*
- *Part 9: Saddles and seat-post test methods*

This corrected version of ISO 4210-5:2014 incorporates a change in Figure 6 and a correction of the format of all tables.

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 5: Steering test methods

1 Scope

This part of ISO 4210 specifies the steering test methods for ISO 4210-2.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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: Terms and definitions*

ISO 4210-2:2014, *Cycles – Safety requirements for bicycles – Part 2: Requirements for city and trekking, young adult, mountain and racing bicycles*

ISO 4210-3:2014, *Cycles – Safety requirements for bicycles – Part 3: Common test methods*

3 Terms and definitions

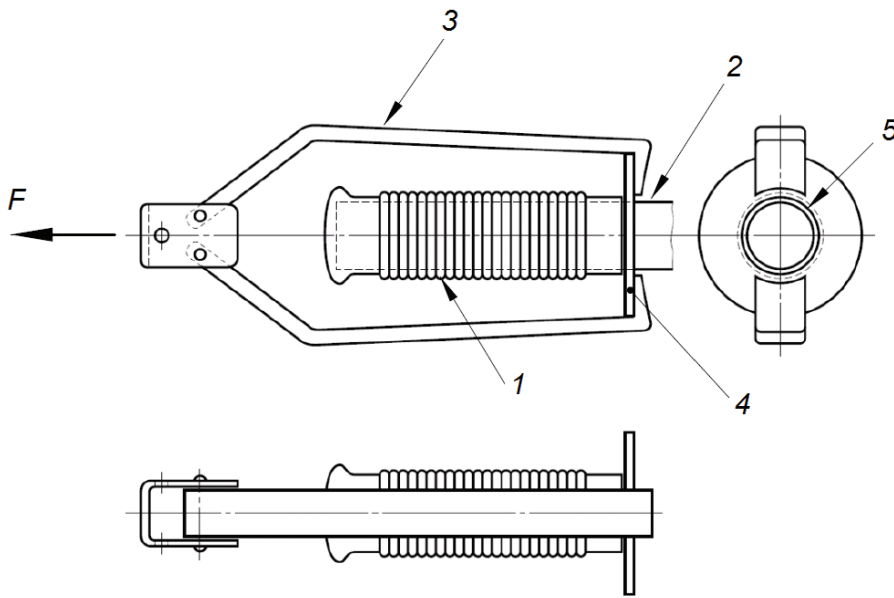
For the purposes of this document, the terms and definitions given in ISO 4210-1 apply.

4 Test methods

4.1 Handlebar grips and plugs

4.1.1 Freezing test

Immerse the handlebar, with handlebar grips or plugs fitted, in water at room temperature for 1 h and then place the handlebar in a freezer until the handlebar is at a temperature lower than -5 °C . Remove the handlebar from the freezer and allow the temperature of the handlebar to reach -5 °C , and then apply a force of 70 N to the grip or plug in the loosening direction as shown in [Figure 1](#). Maintain the force until the temperature of the handlebar has reached $+5\text{ °C}$. It shall be permitted to create a hole in the plug to allow for the testing fixture to be fitted so long as the hole does not affect the seat of the plug in the handlebar and the fixture does not contact the handlebar during the test.



- Key**
- 1 handlebar grip
 - 2 handlebar
 - 3 drawing attachment
 - 4 hooking ring
 - 5 clearance

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NOTE The hooking ring can be divided. <https://standards.iteh.ai/catalog/standards/sist/dd529a09-8057-483f-a8f3-7d8222c5db81/iso-4210-5-2014>

Figure 1 — Example of handlebar grip drawing attachment

4.1.2 Hot water test

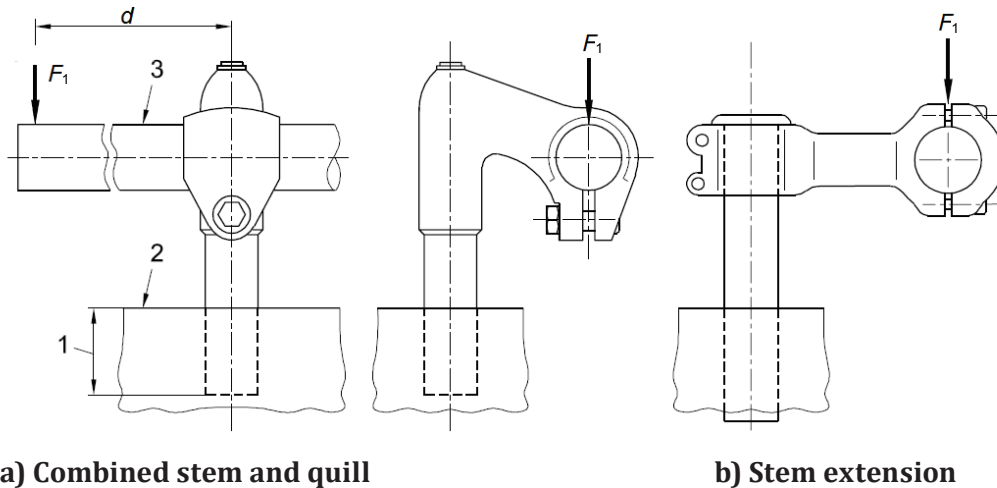
Immerse the handlebar, with handlebar grips fitted, in hot water of +60 °C ± 2 °C for 1 h. Remove the handlebar from the hot water, allow the handlebar to stabilize at ambient temperature for 30 min, and apply a force of 100 N to the grip in the loosening direction as shown in [Figure 1](#). Maintain this force for 1 min.

4.2 Handlebar stem — Lateral bending test

For stems which have a quill for insertion into a fork steerer, clamp the quill securely in a fixture to the minimum insertion depth as specified in ISO 4210-2:2014, 4.7.3, or for stem extensions which clamp directly on to an extended fork steerer, attach the extension to a fork steerer according to the manufacturer’s instructions and clamp this fork steerer securely in a fixture to the appropriate height. Assemble a test bar to the stem, and apply a force of F_1 at a distance of d from the axis of the stem as shown in [Table 1](#) and [Figure 2](#). Maintain this force for 1 min.

Table 1 — Forces and distances on handlebars

Bicycle type	City and trekking bicycles	Young adult bicycles	Mountain bicycles	Racing bicycles
Force, F_1 N	600	600	1 000	1 000
Distance, d mm	300	300	300	230

**Key**

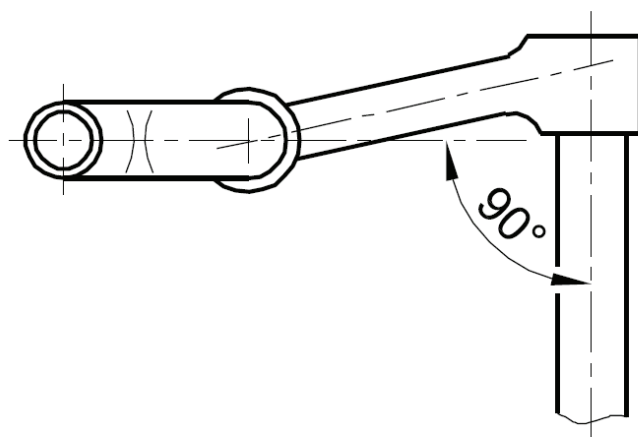
- 1 minimum insertion depth
- 2 clamping block
- 3 solid-steel bar

Figure 2 — Handlebar stem — Lateral bending test**iTeh STANDARD PREVIEW****4.3 Handlebar and stem assembly — Lateral bending test**

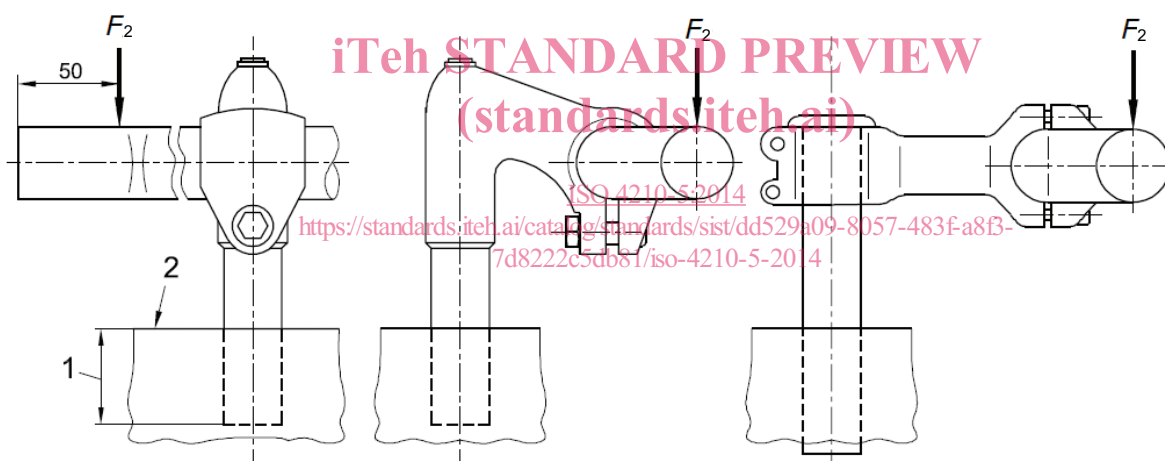
Assemble the handlebar and stem in accordance with the manufacturer's instructions and, unless the handlebar and stem are permanently connected, e.g. by welding or brazing, align the grips portion of the handlebar in a plane perpendicular to the stem axis [see [Figure 3 a\)](#) or [Figure 4 a\)](#)]. For stems which have a quill for insertion into a fork steerer, clamp the quill securely in a fixture to the minimum insertion depth, or for stem extensions which clamp directly on to an extended fork steerer, attach the extension to a fork steerer according to the manufacturer's instructions and clamp this fork steerer securely in a fixture to the appropriate height. Apply a force of F_2 (see [Table 2](#)) at a distance of 50 mm from the free end of the handlebar and parallel to the axis of the fork steerer as shown in [Figures 3](#) or [4](#). Maintain this force for 1 min.

Table 2 — Forces on handlebars

Bicycle type	Forces in newtons			
	City and trekking bicycles	Young adult bicycles	Mountain bicycles	Racing bicycles
Force, F_2	600	600	1 000	1 000



a) Orientation of adjustable handlebars



b) Combined stem and quill

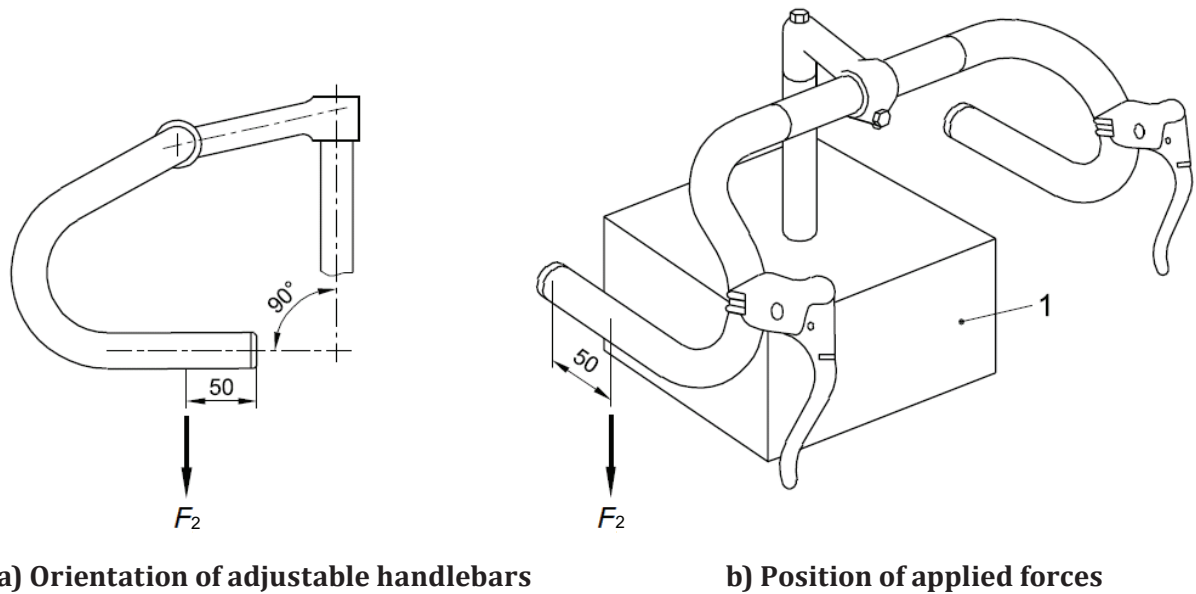
c) Stem extension

Key

- 1 minimum insertion depth
- 2 clamping block

Figure 3 — Handlebar and stem assembly — Lateral bending test for city and trekking, young adult, and mountain bicycles

Dimensions in millimetres

**Key**

1 clamping fixture

Figure 4 — Handlebar and stem assembly — Lateral bending test for racing bicycles
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4.4 Handlebar stem — Forward bending test**4.4.1 Test method for stage 1**

For stems which have a quill for insertion into a fork steerer, clamp the quill securely in a fixture to the minimum insertion depth, or for stem extensions which clamp directly on to an extended fork steerer, clamp the handlebar stem extension securely on to a suitable, solid-steel bar and clamp the bar in securely in a fixture, the projecting length of the bar not being critical.

Apply a force of F_3 through the handlebar attachment point in a forward and downward direction and at 45° to the axis of the quill or steel bar as shown in [Figure 5](#) and maintain this force for 1 min. The forces are given in [Table 3](#). Release the test force and measure any permanent deformation as specified in ISO 4210-2:2014, 4.7.6.3.2.

If the handlebar stem meets the requirement of ISO 4210-2:2014, 4.7.6.3.2, conduct stage 2 of the test.

Table 3 — Forces on stems

Bicycle type		City and trekking bicycles	Young adult bicycles	Mountain bicycles	Racing bicycles
Stage 1	Force, F_3	1 600	1 600	1 600	1 600
Stage 2	Force, F_4	2 000	2 000	2 600	2 300