BS EN ISO 4210-9:2014

BSI Standards Publication

Cycles — Safety requirements for bicycles

Part 9: Saddles and seat-post test methods (ISO 4210-9:2014)

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee GME/25, Cycles.

A list of organizations represented on this committee can be obtained on request to its secretary.

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Cycles - Exigences de sécurité des bicyclettes - Partie 9: Méthodes d'essai de la selle et du poste d'assise (ISO 4210-9:2014)

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Foreword

This document (EN ISO 4210-9:2014) has been prepared by Technical Committee ISO/TC 149 "Cycles" in collaboration with Technical Committee CEN/TC 333 “Cycles” the secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2015, and conflicting national standards shall be withdrawn at the latest by July 2015.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 14764:2005, EN 14766:2005, EN 14781:2005.

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Endorsement notice

The text of ISO 4210-9:2014 has been approved by CEN as EN ISO 4210-9:2014 without any modification.

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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).

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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 4210-9, together with ISO 4210-1, ISO 4210-2, ISO 4210-3, ISO 4210-4, ISO 4210-5, ISO 4210-6, ISO 4210-7, and ISO 4210-8, 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*

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.

INTERNATIONAL STANDARD ISO 4210-9:2014(E)

Cycles — Safety requirements for bicycles —

Part 9:
Saddles and seat-post test methods

1 Scope

This part of ISO 4210 specifies saddle and seat-post 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 General

If a suspension seat-post is involved, the test may be conducted with the suspension system either free to operate or locked. If it is locked, the pillar shall be at its maximum length.

4.2 Saddle/seat-post — Security test

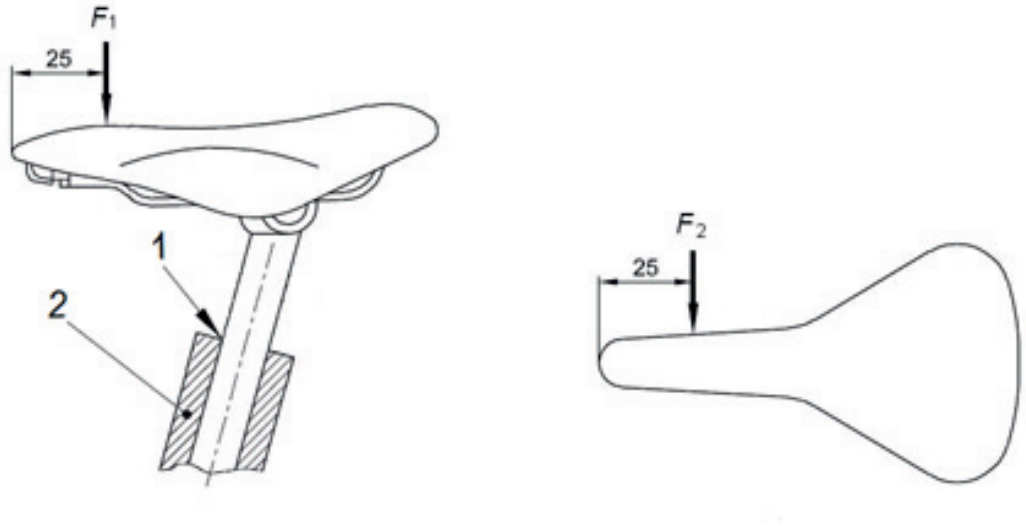
With the seat-post correctly assembled to the bicycle frame at minimum insertion depth of the seat-post (as specified in ISO 4210-2:2014, 4.16.2), and the clamps tightened to the torque recommended by the bicycle manufacturer, apply a force of F_1 vertically downwards at a point 25 mm from either the front or rear of the saddle, whichever produces the greater torque on the saddle clamp. The saddle shall be positioned in the seat-post clamp assembly as defined by the saddle manufacturer's rail markings or instructions. Maintain this force for 1 min. Remove this force and apply a lateral force of F_2 horizontally at a point 25 mm from either the front or rear of the saddle and maintain this force for 1 min, whichever produces the greater torque on the clamp (see Figure 1). The forces are given in Table 1. The fixture shall be such that it does not damage the surface of the saddle.

Table 1 — Forces on saddle

Forces in newtons

Bicycle type	City and trekking bicycles	Young adult bicycles	Mountain bicycles	Racing bicycles
Vertical force, F_1	650	650	650	650
Horizontal force, F_2	250	250	250	250

Dimensions in millimetres



a) Vertical force **b) Horizontal force**

Key

1 minimum insertion-depth mark

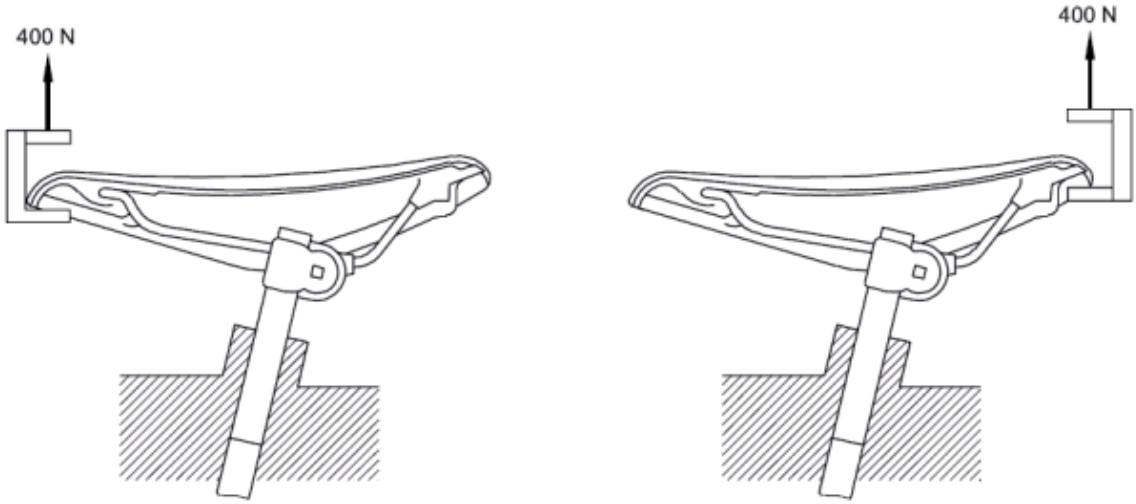
2 bicycle frame

Figure 1 — Saddle/seat-post — Security test

4.3 Saddle — Static strength test

Position the saddle in its maximum rearward direction as defined by the saddle manufacturer's rail markings or instructions, into a suitable fixture representative of a seat-post clamp assembly. Tighten the clamps to the torque recommended by the bicycle manufacturer, and apply forces of 400 N in turn under the rear and nose of the saddle cover, as shown in Figure 2, ensuring that the force is not applied to any part of the chassis of the saddle. The load application point is on the longitudinal plane of the saddle at 25 mm from the back (front) of the saddle. If the saddle design is such that it cannot accept a centreline

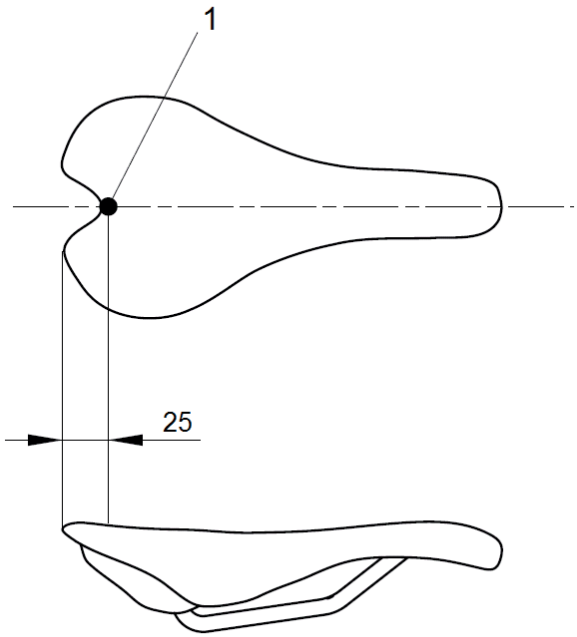
load application, the load shall be symmetrically applied at two points of the saddle. Loading on the rear of the saddle shall be symmetrical about its longitudinal axis, as shown in Figure 3.



a) Force under nose **b) Force under rear**

Figure 2 — Saddle — Static strength test

Dimensions in millimetres



Key
1 loading point

Figure 3 — Saddle — Load application point of static strength test

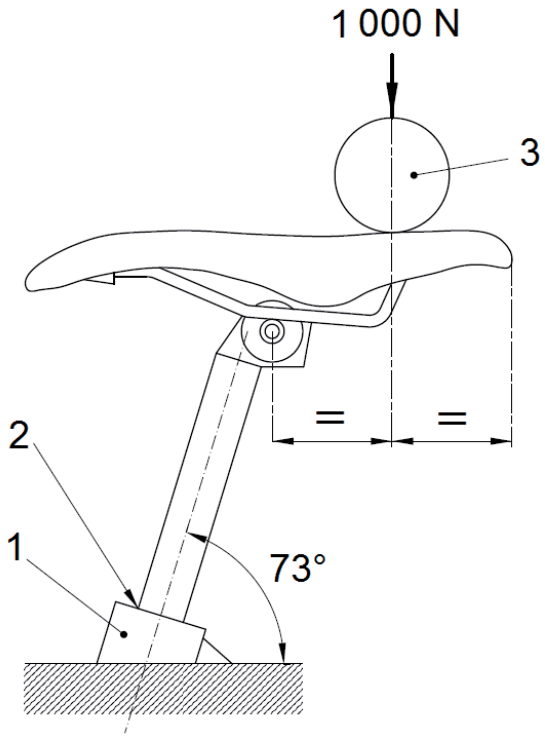
4.4 Saddle and seat-post clamp — Fatigue test

4.4.1 General

Seat-posts can influence test failures of saddles. For this reason, a saddle shall be tested in combination with a seat-post as recommended by the saddle manufacturer.

4.4.2 Test method

Insert the seat-post to its minimum insertion depth (as specified in ISO 4210-2:2014, 4.16.2) in a rigid mount representative of that on the bicycle and with its axis at 73° to the horizontal. The saddle shall be positioned in the seat-post clamp assembly in a maximum rearward direction as defined by the saddle manufacturer's rail markings or instructions. Adjust the saddle to have its upper surface in a horizontal plane and tighten the clamp to the torque recommended by the bicycle manufacturer. Apply a repeated, vertically-downward force of 1 000 N for 200 000 cycles, in the position shown in Figure 4, by means of a pad 300 mm long × 80 mm diameter to prevent localized damage of the saddle cover. The maximum test frequency shall be maintained as specified in ISO 4210-3:2014, 4.5.



Key

1 rigid mount
2 minimum insertion-depth mark
3 pad (length = 300 mm, diameter = 80 mm)

Figure 4 — Saddle and seat-post clamp fatigue test

4.5 Seat-post — Fatigue test and static strength test

4.5.1 General

In the following test, if a suspension seat-post is involved, the test shall be conducted with the suspension system adjusted to give maximum resistance.

4.5.2 Test method for stage 1 (fatigue test)

A seat-post shall be inserted to the minimum insertion depth (as specified in ISO 4210-2:2014, 4.16.2) in a suitable fixture with a representative seat collar and clamped to the manufacturer's recommended torque. The seat-post shall be fixed at an angle of 73° from horizontal, as shown in Figure 5.

Secure an extension-bar to the saddle attachment point by the appropriate attachment fitting such that the bar extends rearwards and downwards at an angle of 10° below the horizontal to permit the application of a vertical test force at a distance of 70 mm from the centre of the saddle clamp where the centreline of the clamp intersects the axis of the bar, as shown in Figure 5.

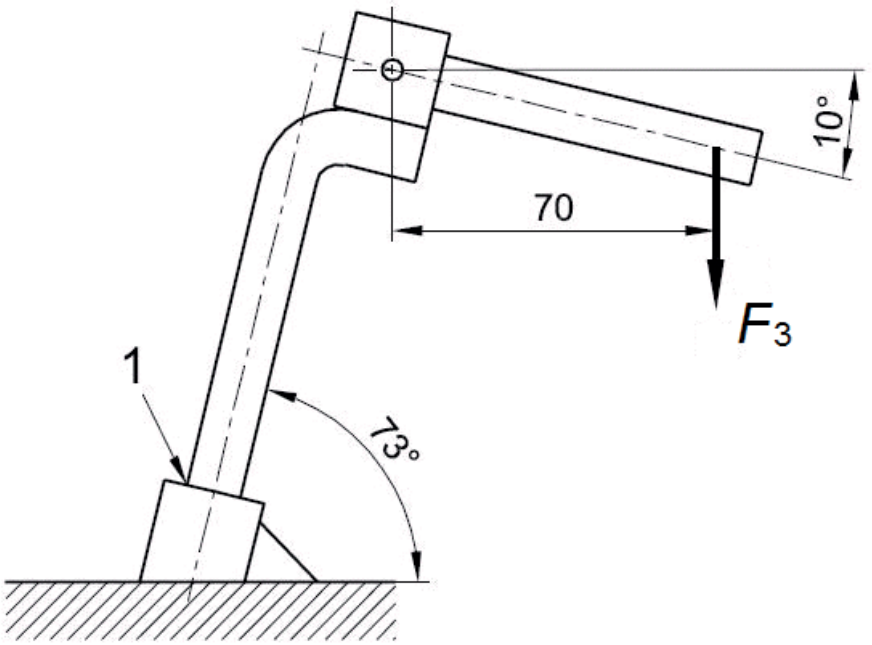
Apply a repeated, vertically downward, dynamic force of F_3 to the point described above and shown in Figure 5 for 100 000 cycles. The forces are given in Table 2. The maximum test frequency shall be maintained as specified in ISO 4210-3:2014, 4.5.

Table 2 — Forces on seat-post

Forces in newtons

Bicycle type	City and trekking bicycles	Young adult bicycles	Mountain bicycles	Racing bicycles
Force, F_3	1 000	1 000	1 200	1 200

Dimensions in millimetres



Key

1 minimum insertion-depth mark

Figure 5 — Seat-post — Fatigue test

4.5.3 Test method for stage 2 (static strength test)

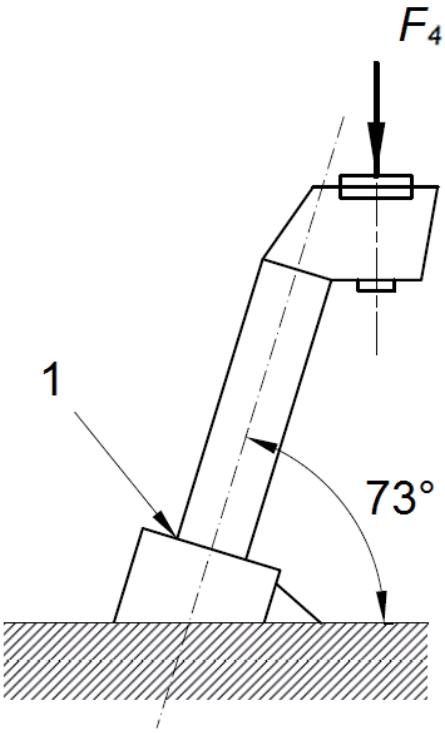
A seat-post shall be inserted to the minimum insertion-depth (as specified in ISO 4210-2:2014, 4.16.2) in a suitable fixture with a representative seat collar and clamped to the manufacturer's recommended torque. The seat-post shall be fixed at an angle of 73° from the horizontal, as shown in Figure 6.

A force of F_4 shall be exerted vertically on the saddle clamp for a duration of 1 min. The displacement at the loading point shall be constantly monitored during testing. The forces are given in Table 3.

Table 3 — Forces on seat-post

Forces in newtons

Bicycle type	City and trekking bicycles	Young adult bicycles	Mountain bicycles	Racing bicycles
Force, F_4	2 000	1 500	2 000	2 000



Key

1 minimum insertion-depth mark

Figure 6 — Seat-post — Static strength test

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