BS EN ISO 20957-4:2016

BSI Standards Publication

Stationary training equipment

Part 4: Strength training benches, additional specific safety requirements and test methods (ISO 20957-4:2016)

bsi.

National foreword

This British Standard is the UK implementation of EN ISO 20957-4:2016. It supersedes BS EN 957-4:2006+A1:2010 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee SW/136/4, Sports, Playground and other Recreational Equipment - Stationary Training Equipment.

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

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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Équipement d'entraînement fixe - Partie 4: Bancs pour haltères, exigences spécifiques de sécurité et méthodes d'essai supplémentaires (ISO 20957-4:2016)

Stationäre Trainingsgeräte - Teil 4: Kraft-Trainingsbänke, zusätzliche besondere sicherheitstechnische Anforderungen und Prüfverfahren (ISO 20957-4:2016)

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 20957-4:2016) has been prepared by Technical Committee ISO/TC 83 “Sports and other recreational facilities and equipment” in collaboration with Technical Committee CEN/TC 136 “Sports, playground and other recreational facilities and equipment” the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2017, and conflicting national standards shall be withdrawn at the latest by June 2017.

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Endorsement notice

The text of ISO 20957-4:2016 has been approved by CEN as EN ISO 20957-4:2016 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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

ISO 20957-4 was prepared by the European Committee Standardization (CEN) Technical Committee CEN/TC 136, *Sports, playground and other recreational facilities and equipment*, in collaboration with ISO Technical Committee TC 83, *Sports and other recreational facilities and equipment*, in accordance with the agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 20957-4:2005), which has been technically revised with the following changes:

— publication as an EN ISO;

— formulation aligned with ISO 20957-1;

— Clause 5 "Safety requirements" specified and restructured;

— Clause 6 "Test methods" specified and restructured;

— normative references updated.

A list of all parts in the ISO 20957 series can be found on the ISO website.

Introduction

This document concerns the safety of strength training benches. It is intended to be used in conjunction with ISO 20957-1. The requirements of this document take priority over the requirements in ISO 20957-1.

INTERNATIONAL STANDARD ISO 20957-4:2016(E)

Stationary training equipment —

Part 4: Strength training benches, additional specific safety requirements and test methods

1 Scope

This document specifies safety requirements for stationary strength training benches and free-standing barbell racks in addition to the general safety requirements of ISO 20957-1. It is intended to be read in conjunction with ISO 20957-1.

This document is applicable to stationary training equipment type benches (type 4) (hereinafter referred to as benches) with the classes S, H and I according to ISO 20957-1.

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 20957-1, *Stationary training equipment — Part 1: General safety requirements and test methods*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 20957-1 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

4 Classification

The classification shall be according to ISO 20957-1.

5 Safety requirements

5.1 General

Depending on the design of the training equipment, the following requirements shall apply as appropriate.

5.2 Benches with fixed barbell supports

5.2.1 Stability of the barbell

Overturning of the barbell by an unequal load shall be prevented either by the distance between the supports or safety device.

Test in accordance with 6.2.

5.2.2 Lateral stability of benches with fixed barbell supports

Benches with fixed barbell supports shall be stable when loaded with unequal load at right angles to the longitudinal axis.

Test in accordance with 6.3.

5.2.3 Longitudinal stability of benches with fixed barbell supports

Benches with fixed barbell supports shall be stable in the longitudinal direction with respect to the bench.

Test in accordance with 6.4.

5.3 Free-standing barbell supports

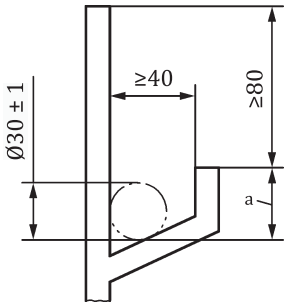
Free-standing barbell supports shall have a device for connecting to the ground.

Test in accordance with 6.1.2.

5.4 Dimensions of the barbell support

The front part of the support (yoke), when measured with a (30 ± 1) mm diameter bar, shall have a vertical height of 20 mm to 40 mm (see footnote a in Figure 1) above the lowest point of the resting bar and the rear part shall be ≥80 mm higher than the top of the front of the support (yoke) (see Figure 1).

Dimensions in millimetres



Key

a Vertical height of the barbell support, 20 mm to 40 mm.

Figure 1 — Dimensions of the barbell support

Test in accordance with 6.1.1.

5.5 Barbell support strength and stability

The rear part of the barbell support shall absorb the loads without breakage, shall not tip over and shall still function as intended by the manufacturer, when subjected to a non-symmetric barbell impact.

Test in accordance with 6.5.

5.6 Loading

For benches classes H, S and I, the intrinsic and extrinsic loading shall comply with ISO 20957-1.

5.7 Barbell support

Any part of the equipment intended to support free weights shall be easily accessible to the user while accepting or replacing the barbell.

Test in accordance with 6.1.3.

6 Test methods

6.1 General

6.1.1 Dimensional check

The measurement shall be done with appropriate measurement devices.

6.1.2 Visual examination

The visual examination shall be done under proper lighting.

6.1.3 Performance test

The tested mechanism shall be actuated as intended by the manufacturer.

6.2 Testing of rotational stability of the barbell

A solid steel bar which is (1 600 ± 50) mm long and has a diameter of (27,5 ± 1) mm shall be placed centrally on the barbell supports. If the bench is designed for use with an Olympic size steel bar, use an Olympic steel bar of (2 200 ± 50) mm instead of the (1 600 ± 50) mm steel bar.

Then one weight disk of

a) 10 kg for class H, and

b) 20 kg for class S

shall be placed on one side of the steel bar with mid-plane of the disk positioned according to Figure 2.

Dimensions in millimetres

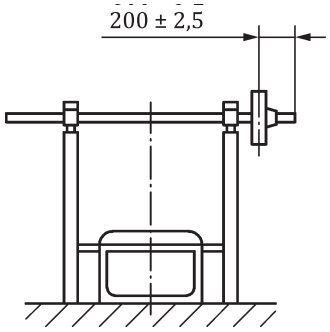


Figure 2 — Stability test under unequal load

6.3 Testing of rotational stability of benches with fixed barbell supports

Test in accordance with 6.2, but with the barbell fixed and

a) with half of the maximum training load specified by the manufacturer, or

b) with 40 kg for class H and 50 kg for classes S and I,

whichever is greater.

6.4 Testing of longitudinal stability

The bench shall be positioned on a $(10^{+1}_{0})°$ slope with the bench oriented such that the barbell support is at the lower end on the slope and the barbell support shall be set to the highest position (see Figure 3). A barbell loaded in accordance with the maximum load as specified by the manufacturer, or 50 kg, whichever is greater, shall be placed on the barbell supports.

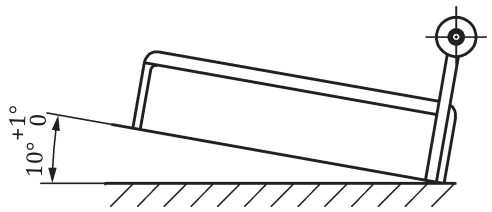


Figure 3 — Stability test in longitudinal direction

6.5 Testing of barbell support strength and stability

Construct a test apparatus in a form of inverted (850 ± 5) mm long pendulum that supports the barbell above the bench or seat and is designed and configured so that when released, the load pivots backwards and strikes only one side of the barbell support at a time at a point (40 ± 5) mm down from the uppermost end of the barbell support from a distance of (300 ± 5) mm. If a bench is attached to the barbell supports, a weight equal to the maximum body weight as specified by the manufacturer shall be distributed evenly over the bench (see Figure 4).

Load the barbell with

a) half of the maximum training load specified by the manufacturer, or

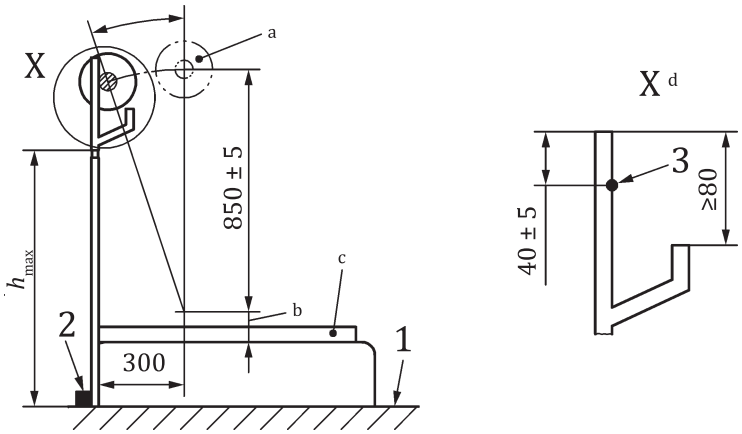
b) 40 kg for class H and 50 kg for classes S and I,

whichever is greater.

NOTE The overall height of the testing device can be varied to achieve the impact location and maintain the pendulum length.

During the test, the training bench shall not be clamped to the ground but a stopper shall be placed against the feet to prevent slipping. Repeat the test procedure 10 times for each side.

Dimensions in millimetres



Key

1 ground
2 stopper
3 impact point
h_{max} maximum height
a Initial position of loaded inverted pendulum.
b Variable height to allow testing device to accommodate the bench being tested.
c Maximum body weight specified by the manufacturer distributed evenly over the bench.
d Barbell not shown for simplicity.

Figure 4 — Load test of the barbell support

7 Test report

The test report shall include at least the information according to ISO 20957-1 and reference to this document, i.e. ISO 20957-4, and ISO 20957-1.

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