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Stationary training equipment —

Part 9: Elliptical trainers, additional specific safety requirements and test methods

Équipement d'entraînement fixe —

Partie 9: Appareils d'entraînement elliptiques, exigences spécifiques de sécurité et méthodes d'essai supplémentaires

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Contents

Page

Foreword

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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 83, *Sports and other recreational facilities and equipment*.

ISO 20957-9 was prepared by Technical Committee ISO/TC 83, *Sports and other recreational facilities and equipment* and by Technical Committee CEN/TC 136, *Sports, playground and other recreational facilities and equipment* in collaboration.

This second edition cancels and replaces the first edition (ISO 20957-9:2005), which has been technically revised. The main changes are as follows:

a) publication as an EN ISO;

b) formulation aligned with ISO 20957-1;

c) Clause 5 specified and restructured;

d) Clause 6 specified and restructured;

e) Normative references updated.

ISO 20957 consists of the following parts, under the general title, *Stationary training equipment*:

— *Part 1: General safety requirements and test methods*

— *Part 2: Strength training equipment, additional specific safety requirements and test methods*

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

— *Part 5: Pedal crank training equipment, additional specific safety requirements and test methods*

— *Part 6 Treadmills, additional specific safety requirements and test methods*

— *Part 7: Rowing machines, additional specific safety requirements and test methods*

— *Part 8: Steppers, stairclimbers and climbers — Additional specific safety requirements and test methods*

— *Part 9: Elliptical trainers, additional specific safety requirements and test methods*

— *Part 10: Exercise bicycles with a fixed wheel or without freewheel, additional specific safety requirements and test methods*

Introduction

This part of ISO 20957 contains additional requirements to ISO 20957-1. The requirements of this specific International Standard take precedence over those in the general standard.

Stationary training equipment —

Part 9: Elliptical trainers, additional specific safety requirements and test methods

1 Scope

This part of ISO 20957 specifies additional safety requirements for elliptical trainers in addition to the general safety requirements of ISO 20957-1.

This part of ISO 20957 specifies safety requirements for cardiovascular equipment with a closed pattern motion and/or a reciprocating motion, where the user's feet are designed to be in contact with the footplatform, but not including steppers, performed from either a standing or seated position.

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 4649:2010, *Rubber, vulcanized or thermoplastic — Determination of abrasion resistance using a rotating cylindrical drum device*

ISO 20957-1:2013, *Stationary training equipment — Part 1: General safety requirements and test methods*

EN 71-1, *Safety of toys — Part 1: Mechanical and physical properties*

3 Terms and definitions

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

3.1
elliptical trainer
stationary training equipment which can produce a continuous closed pattern motion and/or a reciprocating motion similar to an elliptical type of foot action used from a seated or standing position and can include upper body training devices

3.2
footplatform
surface designed to support the foot whilst performing the exercise determined by the manufacturer or for user mounting and dismounting

3.3
footplatform guard
part of the structure designed to help prevent the foot from moving off the footplatform to the inside or front

3.4
movable handlebar
handlebar that is linked to the pedals and moves during the exercise

EXAMPLE Levers used for upper body training.

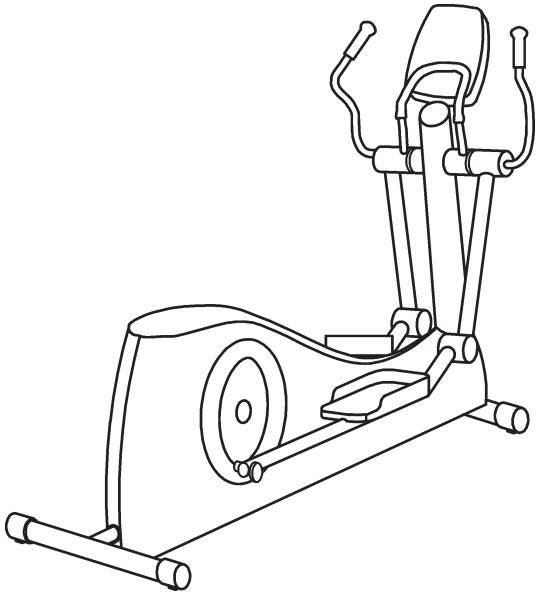
3.5
seat system
seat, seat back rest, adjustment and mounting components

3.6
footplatform guard
part of the structure designed to help prevent the foot from moving off the footplatform to the inside or front

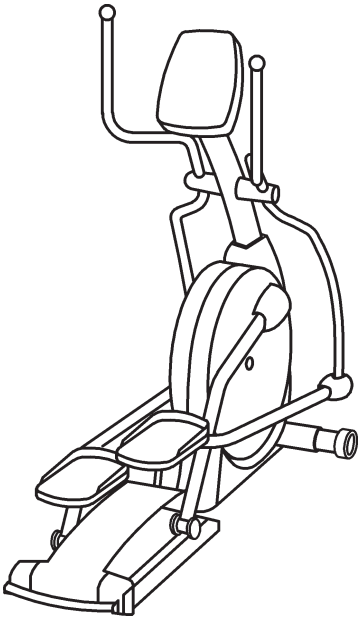
3.7
footplatform guard
part of the structure designed to help prevent the foot from moving off the footplatform to the inside or front

4 Classification

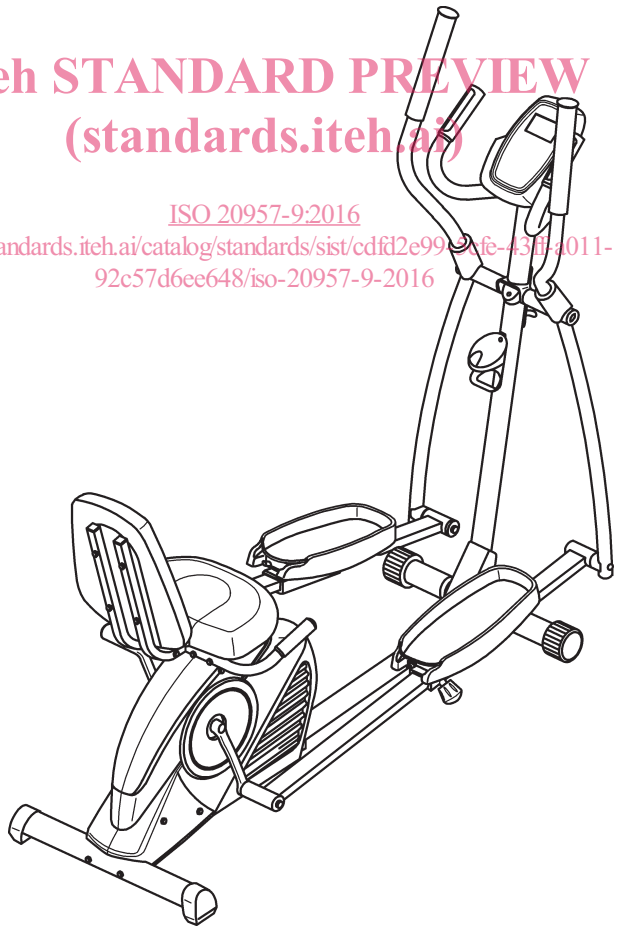
The classification as defined in ISO 20957-1:2013, Clause 4, applies. Examples for different types of elliptical trainers are given in Figure 1.



a) Rear drive elliptical trainer



b) Front drive elliptical trainer



c) Seated elliptical trainer

Figure 1 — Examples of elliptical trainers

5 Safety requirements

5.1 General

Depending on the design of the piece of equipment, the following additional requirements to ISO 20957-1 shall apply as appropriate.

5.2 Squeeze and shear points of external construction within the accessible area

Accessible parts of the elliptical trainer shall be free of squeeze and shear points.

Test in accordance with 6.2.

5.3 Temperature rise of external construction

Accessible parts of the elliptical trainer shall not have a temperature ≥65 °C.

Test in accordance with 6.3.

5.4 Handlebars

5.4.1 Movable handlebars

The movable handlebars shall show no permanent deformation of >3 %.

Test in accordance with 6.5.1.

The ends of movable handlebars shall be designed to reduce the risk of eye socket penetration to the facial area during the intended use for the user and any third party. The design may include, but is not limited to

a) the tip of the handlebar having a cross-section ≥50 mm and an edge radius ≥5 mm, or

b) the handlebar being bent into an inverted U-shape of at least 180°, so as to reduce risk of contact between the facial area and the tip of the handlebar.

Test in accordance with 6.1.1 and 6.1.2.

5.4.2 Non-movable handlebars

The non-movable handlebars shall show no permanent deformation of >3 % of the distance from the floor to the tip of the handlebar.

Test in accordance with 6.5.2.

5.4.3 Seat handlebars

The seat handlebars shall be tested with a vertical load equal to 2 times the maximum user's body mass specified in the user's manual or ≥2 000 N, whichever is greater, applied on each seat handlebar of the equipment one at a time and in the most onerous position.

After the test, the equipment shall not be broken and shall still function as intended by the manufacturer.

All accessible edges shall be rounded with a radius of ≥2,5 mm.

Test in accordance with 6.5.3.

5.5 Footplatforms

5.5.1 Non-slip surface

The footplatforms shall have a non-slip surface of ≥90 % of the total usable surface with a length of ≥300 mm and a width of ≥100 mm. The non-slip surface is defined as any surface with a coefficient of friction of >0,5.

Test in accordance with 6.11.

5.5.2 Guard

The footplatform shall have a guard with a height of ≥30 mm along the complete front of the footplatform and along ≥80% of the length of the inside edge of the footplatform. If there are potential squeeze and/or shear points in the area outside of the footplatform, an additional guard on the outside of the footplatform shall be added to the same requirement as the inside guard.

Seated elliptical trainers shall have an additional guard or heel restraint across ≥90 % of the rear of the footplatform where the movement of the footplatform exceeds an angle of 45° from the horizontal at any time during the movement.

Test in accordance with 6.1.1 and 6.1.3.

5.6 Stability

The training equipment shall not fall over.

Test in accordance with 6.6.

5.7 Endurance

The training equipment shall withstand

— 12 000 cycles for class H, and

— 100 000 cycles for class S.

After the test, the equipment shall not be broken and shall still function as intended by the manufacturer.

Test in accordance with 6.7.

5.8 Seat system

The seat system shall withstand to a static force of the following:

— the maximum user's body mass ±5 % specified in the user's manual or ≥1 000 N, whichever is greater for class H;

— 1,5 times the maximum user's body mass ±5 % specified in the user's manual or ≥1 500 N, whichever is greater for classes S and I.

After releasing the force, the seat system shall not be broken and shall still function as intended by the manufacturer.

Test in accordance with 6.8.

5.9 Additional requirements for class A

The deviation of the measured mechanical power compared to the power indicated by the display shall not exceed ±5 W up to 50 W and ±10 % over 50 W.