INTERNATIONAL STANDARD

ISO 20957-1

first edition
2005-12-15

Stationary training equipment —

Part 1: General safety requirements and test methods

Équipement d'entraînement fixe —
Partie 1: Exigences générales de sécurité et méthodes d'essai

Reference number
ISO 20957-1:2005(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 20957-1 was prepared by Technical Committee ISO/TC 83, *Sports and recreational equipment*.

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*

Introduction

This part of ISO 20957 specifies safety requirements that are generally applicable to stationary training equipment. For specific types of equipment these requirements are supplemented or modified by the requirements of ISO 20957-2, ISO 20957-4, ISO 20957-5, ISO 20957-6, ISO 20957-7, ISO 20957-8 and ISO 20957-9.

Where relevant additional parts exist, this part of ISO 20957 should not be used alone. Special care is required in applying this part alone to equipment for which no specific standard has yet been published.

If the user of the equipment has special needs (medical rehabilitation, disability) the owner (the person with legal responsibility) is required to conduct a specific risk assessment to determine safe use and if necessary to insure trained staff are available to supervise to activity.

Stationary training equipment —

Part 1:
General safety requirements and test methods

1 Scope

This part of ISO 20957 specifies general safety requirements for stationary training equipment during its use, unless modified in other parts of ISO 20957.

It also specifies a classification system (see Clause 4).

This part of ISO 20957 is applicable to all stationary training equipment as defined in 3.1. This includes equipment for use in training areas of organizations such as sport associations, educational establishments, hotels, sport halls, clubs, rehabilitation centres and studios (classes S and I) where access and control are specifically regulated by the owner (person who has the legal responsibility), equipment for domestic use (class H) and other types of equipment including motor driven equipment as defined in 3.1.

The specific requirements of another part of ISO 20957 take priority over the corresponding requirements of this part of ISO 20957.

This part of ISO 20957 does not apply to stationary training equipment intended for use by children.

NOTE 1 In the event that the stationary training equipment is intended for medical purposes, attention is drawn to the requirements of Council Directive of 14 June 1993 on the approximation of the laws of the Member States relating to medical devices 93/42/EEC in addition to the requirements of this part of ISO 20957.

NOTE 2 In the event that the stationary training equipment is designed to be accessible to people with disability, attention is drawn to any relevant national guidelines (see bibliography).

2 Normative references

The following referenced documents are indispensable for the application 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 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*

ISO 8793, *Steel wire ropes — Ferrule-secured eye terminations*

IEC 60335-1, *Household and similar electrical appliances — Safety — Part 1: General requirements*

IEC 60601-1, *Medical electrical equipment — Part 1: General requirements for safety*

ISO 12100-1, *Safety of machinery — Basic concepts, general principles for design — Part 1: Basic terminology, methodology*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
stationary training equipment
(hereinafter referred to as **training equipment**)
equipment that is not moved as a unit during use and which either stands on the floor or is attached to a wall, ceiling or other fixed structure

NOTE Training equipment can be used for example for the following:

a) physical culture, body building or body styling;

b) health fitness training;

c) physical education;

d) training specific to competition and related sports activities;

e) preventive treatment and rehabilitation.

3.2
training area
area in which the user and equipment can move when the equipment is used

NOTE The training area can be utilized to deny third party access to dangerous parts of the equipment.

3.3
accessible hand and foot area
(hereinafter referred to as **accessible area**)

area accessible to user or to third parties when the equipment is in normal use, during setting up, grasping, or adjusting the equipment or the position of the body for exercise

3.4
reverse force
yielding force (eccentric force) when, for example, lowering load

3.5
range of movement
space in which the user or part of the user is moving according to the instructions given in the user's manual

3.6
dynamic direction
direction in which the force is applied during a normal exercise as described in the user's manual

3.7
bodymass
100 kg or the maximum specified user weight as described in the user's manual, whichever is greater

3.8
intrinsic loading
loading due to the user's body mass

3.9
extrinsic loading
loads additional to the user's body mass

3.10
maximum specified load
maximum load specified by the manufacturer

3.11
ergometer
any piece of training equipment that measures the input of power in Watts with a specific accuracy as defined in the applicable specific part of the standard

NOTE This term can only be used for training equipment, which fulfills this condition.

3.12
speed-dependent training equipment
training equipment where the braking torque cannot be adjusted and is proportional to the pedal speed, e.g. a fan driven bike

3.13
speed-independent training equipment
training equipment where the braking torque can be adjusted by other means than speed

3.14
power driven training equipment
training equipment which is driven by external power (e.g. electric motors, pneumatic pistons)

4 Classification

4.1 General

Equipment shall be classified in accordance with accuracy and usage class as described in 4.2 to 4.4.

If the intended use of any equipment is for more classes it shall fulfill the requirements of each intended class.

4.2 Types

The type numbers used in the specific parts are taken from the part numbers.

NOTE For example, Type 2: strength training equipment as defined in ISO 20957-2.

4.3 Accuracy classes

4.3.1 Class A: high accuracy.

4.3.2 Class B: medium accuracy.

4.3.3 Class C: minimum accuracy.

NOTE Accuracy classes are shown in the additional specific parts of ISO 20957.

4.4 Usage classes

4.4.1 Class S (**S**tudio): professional and/or commercial use.

Such training equipment is intended for use in training areas of organizations such as sport associations, educational establishments, hotels, clubs and studios, where access and control is specifically regulated by the owner (person who has the legal responsibility).

4.4.2 Class H (**H**ome): domestic use.

4.4.3 Class I: professional and/or commercial use provided for inclusive use for people with special needs (e.g. visual, hearing, physical or learning disabilities).

Such equipment shall also be in compliance with class S requirements.

Such training equipment is intended for use in training areas of organizations such as sport associations, educational establishments, hotels, clubs, rehabilitation centres and studios, where access and control is specifically regulated by the owner (person who has the legal responsibility).

5 Safety requirements

NOTE Concerning inflammability there may be national regulations with which the products should comply.

5.1 Stability of free-standing equipment

When tested in accordance with 6.3, the training equipment shall not fall over.

5.2 External construction

5.2.1 Edges

All edges and corners of surfaces supporting bodies shall have a radius $r > 2{,}5$ mm.

All other edges of components which are accessible to the user or to third parties shall be free of burrs, and rounded or protected in some other way.

Test in accordance with 6.1.1 and 6.1.3.

5.2.2 Tube ends

When tested in accordance with 6.1.2, accessible tube ends shall be closed off either by parts of the equipment or by plugs.

The plugs shall remain in position at the end of the endurance load test, as prescribed in the relevant parts of the applicable specific standard.

5.2.3 Squeeze, shear, rotating and reciprocating points within the accessible area

For accessible areas up to a height of 1 800 mm, when tested in accordance with 6.1.1 and 6.1.2, the distance between movable parts and adjacent movable or rigid parts shall be not less than 60 mm except as follows:

a) if the fingers only are put at risk the distance shall be not less than 25 mm;

b) if the distance between moving part and rigid part does not change during movement, the distance shall be not more than 9,5 mm;

c) if appropriate, stops and devices are necessary for safety reasons in the training area;

d) if uncontrolled access by third parties is prevented by the user's body position and where the user is able to immediately stop the movement.

NOTE This specification is designed to protect the hand and fingers from injury. Injury to other body parts is considered unlikely.

5.2.4 Weights

The range of motion of all weights attached to the training equipment shall be limited to that required to perform the exercise. Test in accordance with 6.1.2 and 6.1.4.

NOTE 1 This may be achieved by appropriate design.

NOTE 2 An example of an undesirable characteristic is uncontrolled pendulum swing.

Stacked weights shall move freely and return to the resting point except when displaced intentionally.

5.3 Equipment access and escape

If the user cannot (after adjusting the equipment according to the manufacturer's instructions) attain the loaded starting position for the equipment then the equipment shall be provided with a means of assistance, e.g. pedal or lever to adjust the start/finish position of the exercise.

Testing shall be in accordance with 6.7.

5.4 Adjustment and locking mechanisms

When tested in accordance with 6.1.2 and 6.1.4, adjustment facilities on the training equipment shall function securely, be conspicuous and safely accessible to the user. The possibility of inadvertent alteration shall be eliminated.

Adjustment components such as knobs and levers shall not interfere with the user's range of movement.

The proper function of any locking mechanism shall be clearly self-evident.

Weight selection pins shall be fitted with a retention device to prevent inadvertent alteration or movement during the exercise.

5.5 Ropes, belts and chains

5.5.1 General

Ropes, belts, chains and attachment devices shall have a safety factor against breakage of 6 × the maximum possible tension that can be developed. The diameter of the pulleys shall be in accordance with the applicable requirements of the rope, belt or chain manufacturers.

NOTE 1 Attachment devices are snap links, shackles, carabiners, clamps or similar (excludes e.g. handgrips).

When the tension developed is lower than the limit value specified in this part of ISO 20957, the equipment shall be tested at that limit.

When tested in accordance with 6.4, the ropes shall not break and shall be capable of normal functioning.

NOTE 2 Normal functioning means no disconnection and no obvious damage.

5.5.2 Wire ropes and pulleys

5.5.2.1 Normal wire ropes shall be made of galvanized or corrosion-resistant wires. Test shall be in accordance with 6.1.5.