INTERNATIONAL STANDARD

ISO 20957-8

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Stationary training equipment —

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

Équipement d'entraînement fixe —

Partie 8: Monte-escaliers, escalators et simulateurs d'escalade — Exigences spécifiques de sécurité et méthodes d'essai supplémentaires

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Foreword

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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 20957-8 was prepared by CEN (as EN 957-8) and was adopted, under a special “fast-track procedure”, by Technical Committee ISO/TC 83, *Sports and recreational equipment*, in parallel with its approval by the ISO member bodies.

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*

Contents

Foreword

This European Standard has been prepared by Technical Committee CEN/TC 136 “Sports, playground and other recreational 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 December 1998, and conflicting national standards shall be withdrawn at the latest by December 1998.

This standard EN 957 “Stationary training equipment” consists of the following parts:

— *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*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

Introduction

This part of EN 957 concerns the safety of steppers, stairclimbers and climbers.

It amends and supplements EN 957-1. The requirements of this specific standard take priority over those in the general standard.

1 Scope

This part of EN 957 specifies safety requirements for stepper, stairclimber and climber machines (hereafter called training equipment) in addition to the general safety requirements of EN 957-1 and should be read in conjunction with it.

This part of EN 957 is applicable to stationary training equipment type stepper, stairclimber and climber training equipment (type 8), within classes S and H and class A for accuracy.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

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

EN 957-1:1996, *Stationary training equipment — Part 1: General safety requirements and test methods.*

ISO 5904, *Gymnastic equipment — Landing mats and surfaces for floor exercises — Determination of resistance to slipping.*

3 Definitions

For the purposes of this standard the definitions of EN 957-1 and the following apply.

3.1
stepper
stationary training equipment where the feet move in a reciprocating motion without the foot having to leave the foot pedal (see figure 1)

3.2
stairclimber
Stationary training equipment similar to a moving mechanical staircase or escalator (see figure 2)

NOTE Work is carried out by simulating climbing a conventional staircase.

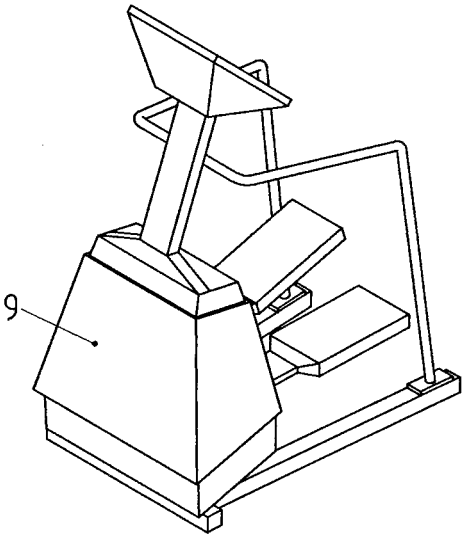
3.3
Climber
stationary training equipment that is equipped with feet and hand positions that can be moved in a reciprocating motion (see figure 3)

3.4
dependent action
movement of each foot pedal linked directly or indirectly

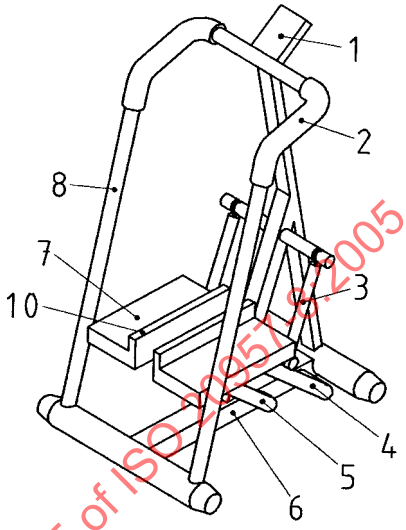
3.5
independent action
movement of each foot pedal not linked

3.6
step
downward movement of either foot pedal or stair

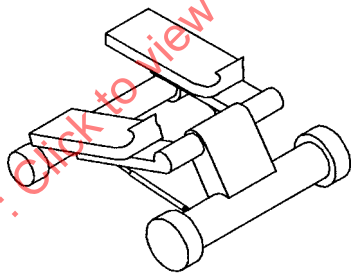
3.7
foot guard
a raised edge, see figures 1 and 5



a) Stepper class S



b) Stepper class H

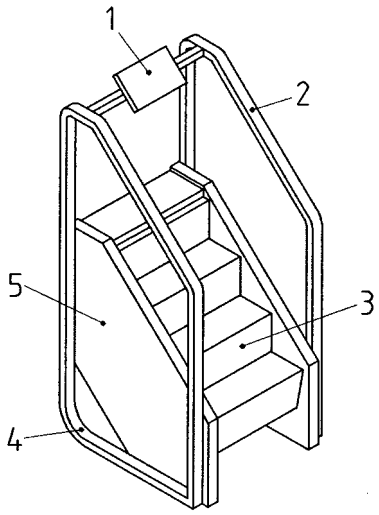


c) Ministepper

Key
1 Display
2 Hand grip
3 Hydraulic piston/resistance
4 Lever arm
5 Pedal stabilizing arm
6 Base frame
7 Foot pedal
8 Handrail/handlebar
9 Housing
10 Foot guard

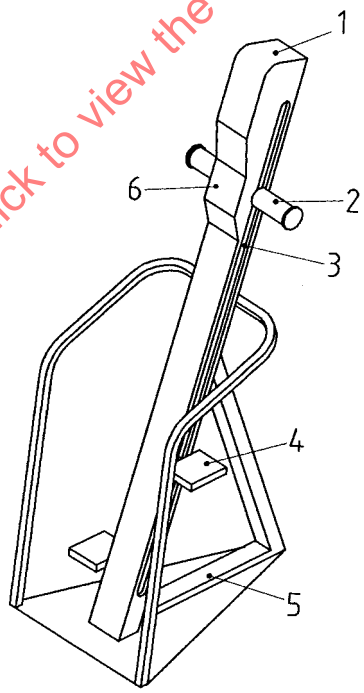
Figure 1 — Examples of steppers

EN 957-8:1998 (E)



Key
1 Display
2 Handrail
3 Stair
4 Base frame
5 Housing

Figure 2 — Example of a stairclimber



Key
1 Display
2 Movable handgrip
3 Track rail
4 Foot pedal
5 Base frame
6 Resistance adjustment

Figure 3 — Example of a climber

6

4 Classification

Clause 4 of EN 957-1:1996 applies.

5 Safety requirements

5.1 General

Depending on the design of the piece of equipment the requirements in accordance with 5.2 to 5.8 shall apply as appropriate.

5.2 External construction

5.2.1 Squeeze, shear and reciprocating parts within the accessible area

The distance between movable parts and adjacent movable or rigid parts shall be at least 25 mm if relevant only for fingers, otherwise it shall be 60 mm.

Required stops are excluded (if the user is not put at risk).

The 25 mm and 60 mm do not apply when the squeeze points remain within the user's field of vision (see figure 4) over the full range of movement.

When the training machine is not in use the 25 mm requirement applies.

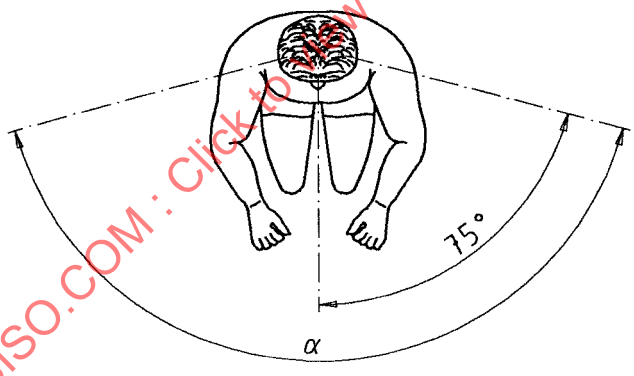


Figure 4 — Field of vision

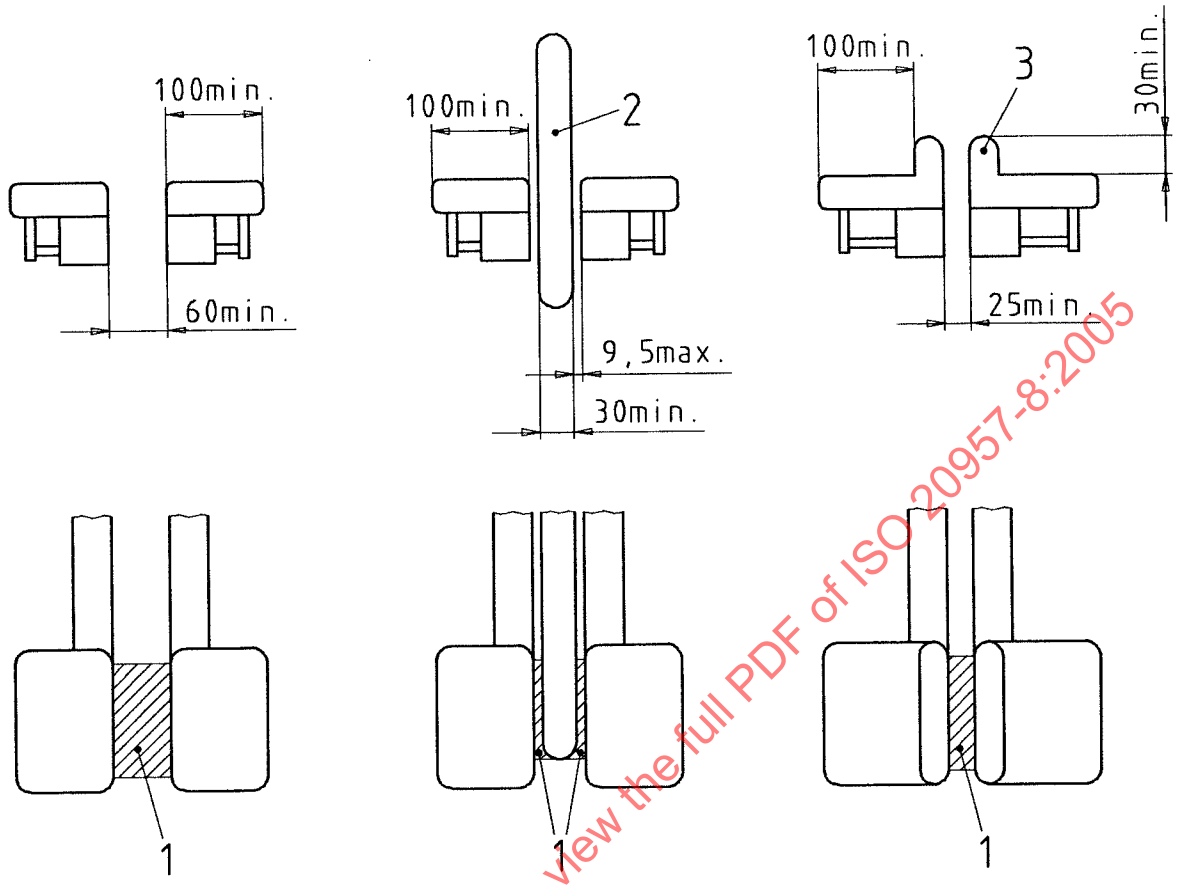
If the distance between the pedals is more than 60 mm no fence is required on the inside of the foot pedals (see figure 5 a)).

Where the pedals are separated by a fixed part of the machine (e. g. a frame, guard or smooth cover) with a minimum width of 30 mm, there shall be a constant distance of not more than 9,5 mm and no foot guard is required on the inside of the foot pedals (see figure 5 b)).

Where the inside edge of the foot pedals have a foot guard 30 mm high, the distance between the foot pedals can be a minimum of 25 mm (see figure 5 c)).

In all 3 cases there shall be no further projections within the free space, e. g. bolts, beyond the inside edge of the pedals.

Dimensions in millimeters



Key
1 free space
2 closed flat area with constant distance
3 foot guard

Figure 5 — Squeeze points

If the lever arm or foot pedal is used as an accessible stop this stop shall have a flat contact area with a minimum surface area of 800 mm^2 and edges of the stop shall have a minimum radius of 2,5 mm. The maximum stop load shall not exceed the body weight.

The minimum distance between the base of the foot pedal and the floor or base frame shall be not less than 60 mm, excluding accessible stops.

Test in accordance with 6.2.

5.2.2 Transmission elements and rotating parts

All transmission elements, e. g. fans and flywheels, shall be protected, so that users finger cannot be trapped.

Test in accordance with 6.2.

5.2.3 Temperature rise

Immediately after testing in accordance with 6.3, accessible parts of the equipment shall not exceed a temperature greater than 65 °C.

5.3 Intrinsic loading

5.3.1 Each piece of equipment of **class H** loaded with the user's bodymass shall withstand 2,5 times the bodymass (100 kg) without breakage.

Testing in accordance with 6.4.

5.3.2 Each piece of equipment of **class S** loaded with the user's bodymass shall withstand 2 times the bodymass (100 kg).

When tested according to 6.4, supports (e. g. load bearing surfaces) shall not be deformed by more than f = 1/100, cantilever supports (cantilever surfaces) by more than f = 1/150 and other dimensions by more than 1 %.

The training equipment shall not break when a static load of 4 times the bodymass is applied.

A body mass of 100 kg is taken as nominal load.

After the test
- supports (e. g. load bearing surfaces) shall not be deformed by more than f = 1/100;
- cantilever supports (cantilever surfaces) by more than f = 1/150;
- other dimensions by more than 1/100.

5.4 Handrails/handlebars

If equipped with handrails or handlebars these shall show no permanent deformation of more than 3 % when tested in accordance with 6.5.

All accessible edges shall be rounded with a radius of not less than 2,5 mm.

Test in accordance with 6.5.

5.5 Foot pedals and stairs

All accessible edges of foot pedals and stairs shall be rounded with a radius of not less than 2,5 mm.

When tested in accordance with ISO 5904, the friction factor of the pedal/stair surface shall be more than 0,5.

The minimum width of the foot pedals and stairs excluding the foot guards shall be 100 mm.

5.6 Endurance test

When tested in accordance with 6.6, the training equipment shall withstand
- 12 000 cycles for class H and
- 100 000 cycles for class S.

After the test the training equipment shall be capable to functioning according to the manufacturer's information on the correct use and shall not show any signs of damage, e. g. oil leakage.

5.7 Free wheel

In the case of air fan or flywheel assisted steppers then the transmission assembly should be of a free wheel type.

Testing in accordance with 6.1.2 and 6.1.4.