International Standard

ISO 20957-1

Third edition
2024-11

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 20957-1:2024(en)

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Published in Switzerland

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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).

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For an explanation of the voluntary nature of standards, 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 www.iso.org/iso/foreword.html.

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

This third edition cancels and replaces the second edition (ISO 20957-1:2013), which has been technically revised.

The main changes are as follows:

— Clause 2 was updated;

— Clause 3 was updated by removing, renaming, and adding entries;

— Clause 5 was updated so that 5.3.4 combines requirements for squeeze and shear points and 5.13 combines loading requirements;

— Clause 6 was updated so that 6.15 creates a single test method for loading testing;

— Annex A was added to provide informative examples for carrying out load testing.

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

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document specifies safety requirements that are applicable to all stationary training equipment. For specific types of equipment these requirements are supplemented or modified by the requirements of the other parts of the ISO 20957 series.

This document should be used in conjunction with the other parts of the ISO 20957 series.

Stationary training equipment —

Part 1:
General safety requirements and test methods

1 Scope

This document specifies general safety requirements and test methods for indoor stationary training equipment. Other parts of the ISO 20957 series can modify the requirements contained in this document. This document also covers environmental aspects.

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

This document is applicable to all stationary training equipment. 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 is 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 requirements of other parts of the ISO 20957 series take priority over the corresponding requirements of this general standard.

This document does not apply to stationary training equipment intended for outdoor use. It also does not apply to stationary training equipment intended for use by children under the age of 14 years, unless such stationary training equipment is intended for educational purposes in schools and other pedagogical contexts for children under the supervision of a qualified adult instructor.

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 12100:2010, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

IEC 60335-1:2023, *Household and similar electrical appliances — Safety — Part 1: General requirements*

IEC 60601-1:2006, *Medical electrical equipment — Part 1: General requirements for basic safety and essential performance*

3 Terms and definitions

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

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

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

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

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

Note 1 to entry: Stationary training equipment can be used for example for the following:

a) body building or body shaping;

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 occupied by the user and the equipment while exercising over the full *range of movement* (3.5)

3.3
free area
area in addition to the *training area* (3.2) which is required for the user or third party to access the equipment and/or conduct an emergency dismount outside the full *range of movement* (3.5)

3.4
accessible hand and foot area
area accessible to the hand or foot of either a user or a third party when the equipment is in normal use, during exercise set-up, grasping, adjusting the equipment or the position of the body for exercise

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

3.6
body mass
maximum specified user mass as described in the user's manual or 100 kg, whichever is greater

3.7
maximum training load
maximum load specified by the manufacturer in the user's manual and in the marking

3.8
heart rate control mode
programme that allows the user to maintain training with a predetermined heart rate level by adjusting the loading parameters automatically to the user's heart rate response

Note 1 to entry: Loading parameters can be resistance or speed or incline or a combination of these.

3.9
heart rate measurement system
system which displays the heart rate of the user

3.10
display
device that provides information to the user

3.11
squeeze point
place where parts of the equipment can move against each other, or against a fixed area, which can result in parts of user's or third person's body being crushed

3.12
shear point
place where part of the equipment can move past a fixed or moving part, or past a fixed area, which can result in parts of user's or third person's body being cut

3.13
cycle
movement associated to one complete operation of a single component from start to start of a repetitive process

EXAMPLE A typical component is a pedal, handlebar or seat.

3.14
most onerous position
position that maximizes the likelihood of a negative outcome

EXAMPLE The most onerous position in the case of stability is the orientation of the equipment in which it is least stable, i.e. the centre of gravity of the equipment is as high as possible and/or outside or as close as possible to the edge of equipment's base while the equipment is placed on a tilted table.

3.15
flywheel
rotating mass designed to create inertia

3.16
guard
barrier between the user and the hazard

3.17
protective cover
cover provided to protect the user from inadvertent access to hazardous parts of the training equipment

Note 1 to entry: Hazardous parts include moving parts, gear systems, hot surfaces, etc.

4 Classification

4.1 General

Equipment shall be classified in accordance with accuracy and usage classes as described in 4.2 and 4.3.

If the intended use of the equipment is for more than one usage class, it shall fulfil the requirements of each class.

4.2 Accuracy classes

Accuracy classes only apply to equipment which display training data.

NOTE The requirements of accuracy classes are shown in the additional parts of the standard series ISO 20957.

4.2.1 Class A: high accuracy.

4.2.2 Class B: medium accuracy.

4.2.3 Class C: low accuracy.

4.3 Usage classes

4.3.1 Class S (studio): professional and/or commercial use.

NOTE 1 Such stationary 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 are specifically regulated by the owner (person who has the legal responsibility).

4.3.2 Class H (home): domestic use.

NOTE 2 Such stationary training equipment is intended for use in private homes where access to the equipment is regulated by the owner (person who has the legal responsibility).

4.3.3 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 accordance with class S requirements.

NOTE 3 Such stationary 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 are specifically regulated by the owner (person who has the legal responsibility).

5 Safety requirements

5.1 General

If any of the following safety requirements are applicable, the equipment shall meet the requirements using the test methods described in Clause 6.

5.2 Stability

The stationary training equipment shall be stable in any direction, in training, folding and storage positions.

The test shall be in accordance with 6.2.

5.3 External construction

5.3.1 General

Equipment shall be free of burrs.

Test shall be in accordance with 6.3.1.

5.3.2 Edges and corners

All edges and corners of surfaces supporting bodies shall have a radius $r \geq 2{,}5$ mm. All edges within the accessible hand and foot area shall be rounded or protected.

Test shall be in accordance with 6.3.1.

5.3.3 Tube ends

All tube ends within the accessible hand and foot area shall be closed off, for example by parts of the equipment or by plugs.

If plugs are used, they shall remain in position at the end of the endurance load test, as described in the relevant part(s) of the ISO 20957 series. If no endurance test is described in the applicable part, the pull-out force of the plug shall be ≥ 20 N.

Test shall be in accordance with 6.3.2.

5.3.4 Squeeze and shear points

Squeeze points and/or shear points within the accessible hand and foot area, whether between moving parts, between moving parts and fixed parts, or between a moving part and the floor, shall be guarded by a protective cover or shall have a minimum clearance of at least 60 mm, with the following exceptions.

a) If only the fingers are at risk, the distance shall be at least 25 mm.

b) If third party access is prevented by the user's body position, and where the user is able to immediately stop the movement, the distance shall be at least 25 mm.

c) If the distance between the moving part and the fixed part, or between two moving parts, does not change during use or setup, the distance shall be greater than 25 mm or less than 9,5 mm.

d) If the angle between two adjacent moving parts or between a rigid part and an adjacent moving part is always 50 degrees or greater, it is not considered a shear point.

e) Open and obvious stops are excluded; however, if the stop is the part which is moving, then it shall pass no closer than 25 mm from any fixed frame member throughout its range of movement.

f) If the following three requirements are simultaneously met during folding and unfolding, it is not considered a squeeze or shear point.

   1) Inadvertent movement is not possible during folding, unfolding, transportation and/or storage.

   2) Access to squeeze points and shear points remains at all times in the user's field of vision.

   3) The user can stop the motion at any time.

Test shall be in accordance with 6.3.3.

5.3.5 Weights and other resistance means

The range of motion of all weights attached to the stationary training equipment shall be limited to that required to perform the exercise.

Weights and other resistance means with stored energies (e.g. bungee cords, elastic tubes, springs) shall move freely and return to the starting point.

Weights shall be securely retained during use.

Test shall be in accordance with 6.3.4.

5.4 Entrapment of the user

Users shall be able to exit the equipment when using it according to the user's manual. If necessary, means of escape shall be provided.

Test shall be in accordance with 6.4.

5.5 Adjustment components and locking mechanisms

Adjustment components and locking mechanisms on the stationary training equipment shall function securely and be conspicuous, self-evident and safely accessible to the user.

The possibility of unintended movement should be avoided.

Adjustment components and locking mechanisms, for example knobs and levers, shall not interfere with the user's range of movement.

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

Test shall be in accordance with 6.5.

5.6 Ropes, belts, chains and attachment components

5.6.1 General

Ropes, belts, chains and their attachment components (e.g. snap links, shackles, carabiners, clamps or similar) shall withstand tension equal to 6 times the maximum possible tension that can be developed.

The design of the pulleys and the bending radius should be in accordance with the applicable requirements of the rope, belt or chain manufacturers.

After the test, the training equipment shall not be broken or have visible signs of fracture or cracking and shall still function as intended by the manufacturer.

Test shall be in accordance with 6.6.

5.6.2 Ropes and belts

Rope and belt ends shall be, as a minimum, flush with the end of the termination means and shall be visible for inspection.

Pressed connections shall not be subjected to bending.

Rope and belt ends and grips shall have no sharp edges or frayed ends.

Test shall be in accordance with 6.6.

5.6.3 Rope and belt guides

A means shall be provided to prevent a rope or a belt becoming unintentionally disengaged during use or set-up.

Test shall be in accordance with 6.7.

5.7 Pull-in points

5.7.1 General

The test finger (see Figure 1) shall not become trapped.

Test shall be in accordance with 6.3.5.1.

5.7.2 Pulleys

Pull-in points of rope or belt drives up to 1 800 mm height shall be guarded, except

a) if the surface pressure is ≤ 90 N/cm^2, or

b) when access to the pull-in point is prevented by the user's body during exercising.

If a guard is required, the angle between the rope or belt and the guard shall be ≥ 50° in all positions. The guard shall not rotate around the axis of the pulley as the pulley rotates.

Test shall be in accordance with 6.3.5.2.

5.7.3 Chains, gears and sprockets

Pull-in points for chains, gears and sprockets shall be protected in accordance with ISO 12100:2010.

Test shall be in accordance with 6.3.5.3.

5.8 Hand grips

5.8.1 Integral handgrips

Gripping positions shall be easily identifiable and designed to reduce slipping (e.g. textured, coated, knurled).

Test shall be in accordance with 6.8.

5.8.2 Applied handgrips

Applied handgrips shall not be removed. Applied handgrips shall be equipped with a surface that reduces hand slip.

Test shall be in accordance with 6.9.

5.8.3 Rotating handgrips

Rotating handgrips shall be secured during use and shall be designed to reduce slipping (e.g. textured).

Test shall be in accordance with 6.10.

5.9 Endurance

The training equipment shall withstand for:

a) class H: 12 000 cycles;

b) class S: 100 000 cycles;

After the test, the training equipment shall not be broken or have visible signs of fracture or cracking and shall still function as intended by the manufacturer.

Test shall be in accordance with 6.11.

5.10 Isometric test function

Stationary training equipment designed to perform an isometric test shall have the load or force on the user's body displayed with an accuracy of ±10 % in the range of measurement given in the user's manual.

Test shall be in accordance with 6.12.

5.11 Heart rate measurement system

5.11.1 Indication

The function of the heart rate measurement system shall be indicated on the display when the equipment is receiving a usable signal from the user, e.g. a blinking heart.

Test shall be in accordance with 6.13.

5.11.2 Heart rate control mode

For equipment using the heart rate measurement system to control resistance, speed or other effort intensity, the loss of heart rate signal shall result in effort intensity remaining at the same intensity for maximum 60 s and then decrease until the minimum intensity is reached. The rate of decrease shall be at least 10 % in each 20 s time period.

Test shall be in accordance with 6.14.

5.12 Electrical safety

For electrical and electronic aspects of stationary training equipment, IEC 60335-1:2023 shall be applied. For medical devices, IEC 60601-1:2006 shall be applied.

5.13 Loading

Stationary training equipment that is loaded with the user's body mass, training load, or a combination of body mass and training load shall withstand a test load F_{test} as calculated in accordance with Formula (1):

$$F_{test} = S(W_p + 1{,}5F_a) \quad (1)$$

where

F_{test} is the total reactionary load to be applied during the test, in newton;

S is the safety factor, which is equal to 2,5;

W_p is the user's body mass portion of the load applied to the part of the equipment being evaluated, either 100 kg or the maximum user body mass as specified by the manufacturer, whichever is greater, in newton;

1,5 is the dynamic coefficient;

F_a is the load applied to the part of the equipment being evaluated, derived from the maximum specified load while performing exercise, in newton.

Formula (1) calculates the magnitude of the test load F_{test}, but the determination of how to distribute the test load over the equipment requires an understanding of how the stationary training equipment is loaded during regular use.

The distribution of the test load F_{test} should be applied to the equipment to best simulate the loading distribution applied to the equipment during regular use. If the equipment can be used in multiple ways, then it can be necessary to apply the test load F_{test} to the equipment multiple times in multiple loading distributions to be representative of the most onerous loading condition(s).

After the test, the training equipment shall not be broken or have visible signs of fracture or cracking and shall still function as intended by the manufacturer.

Test shall be in accordance with 6.15.

5.14 Care and maintenance

Care and, if applicable, maintenance advice shall be provided with each piece of equipment. The advice shall include at least:

a) a warning notice indicating that the safety level of the equipment can be maintained only if it is examined regularly for damage and wear, e.g. ropes, pulleys, connection points;

b) advice to replace defective components immediately and/or keep the equipment out of use until repair;

c) special attention to components most susceptible to wear.

Test shall be in accordance with 6.16.

5.15 Assembly instructions

If the stationary training equipment requires assembly, an assembly manual in the national language shall be available, including at least:

a) warning and precautions for safe handling of the stationary training equipment during the assembly process;

b) clear and accurate assembly instructions;

c) a list of tools needed;

d) a comprehensive parts list including part numbers;

e) the total mass and the total surface area (e.g. footprint) of the equipment;

f) instruction that free-standing equipment shall be installed on a flat, stable and horizontal base;

g) if stationary training equipment is attached or anchored, for example to a wall or to the floor, instructions including the attaching or anchoring operations with the minimum value (force) each attachment shall withstand.

Test shall be in accordance with 6.16.

5.16 General instructions for use

An owner's manual shall be available for each stationary training equipment in the national language including at least:

a) customer service contact information (e.g. address, website, etc.);

b) name and full address of the manufacturer or importer;

c) indication that the field of application is for indoor use only and an explanation of the usage class (e.g. H or S);

d) a dedicated figure to illustrate the free area and training area with an indication that:

   1) the free area shall be at least 0,6 m greater than the training area in the directions from which the equipment is accessed;

   2) the free area shall include the area for emergency dismount;

   3) where equipment are positioned adjacent to each other, the free area may be shared.

e) information on the correct use of the equipment and its features with the emphasis on safe operation, and the importance of keeping unsupervised children away from the equipment;

f) exercise instructions with advice on the correct biomechanical positioning of the user on the stationary training equipment for every major exercise type for which the equipment is designed, including a warning indicating that injuries to health can result from incorrect or excessive training;

g) statement that the owner shall provide the user with all warnings and instructions;

h) design illustration;

i) illustrations to accompany texts concerning difficult or complicated manoeuvres;

j) instruction on how to safely use access and escape assist means;

k) setting of the load and equipment further adjustments (e.g. seat adjustments);

l) warning, if applicable, that if any of the adjustment devices are left projecting, they can interfere with the user's movement;

m) warning that free standing equipment shall be positioned on a flat, stable and horizontal base;

n) indication of the maximum user body mass;

o) indication of the maximum training load, if applicable;

p) explanation of the displayed data, if applicable;

q) if a heart rate system exists, a warning with the following content: “WARNING! Heart rate monitoring systems can be inaccurate. If you feel faint, stop exercising immediately”;

r) for accuracy classes B and C, indication that the equipment is not suitable for high accuracy purposes.

Test shall be in accordance with 6.16.

5.17 Marking

5.17.1 Permanent marking

Stationary training equipment shall be permanently marked with the following minimum information:

a) name or trademark and full address of the manufacturer, supplier or importer;

b) maximum body mass of user and the maximum training load for the individual exercise stations (if applicable);

c) usage classes S, H or I and accuracy classes A, B or C, which can be combined (e.g. SA) if both classes are specified in the relevant part(s) of the ISO 20957 series, if applicable;

d) individual code number (which contains information about type and year of manufacture);

e) graphical symbol or written information in the national language(s) instructing the user to read the information supplied by the manufacturer;

f) for class S and I equipment, a conspicuous graphical symbol or written information in the national language(s) shall be applied if the equipment needs attachment/anchoring for safe operation.

It is the responsibility of the manufacturer to display conformity to this document by the additional indication of ISO 20957 in connection with the letter symbol of the usage class(es) (class S, H and I).

Test shall be in accordance with 6.16.

5.17.2 Additional marking

If a heart rate system exists, for classes S and I, a warning with the following content shall be provided:

“WARNING — Heart rate monitoring systems can be inaccurate. If you feel faint, stop exercising immediately.”

The heart rate warning shall be placed in a conspicuous position on or near the console visible during training or the warning shall be shown on the display at any time while the heart rate system is active.

6 Test methods

6.1 Test conditions

All testing shall be performed under the following conditions:

a) temperature of 23 °C ± 5 °C;

b) relative humidity of 55 % to 75 %.

6.2 Stability test

6.2.1 Test in training position

Place the equipment on a $(10^{+1}_{-0})°$ incline surface, in the most onerous position.

Perform exercise(s) that involve(s) the user's mass, with the equipment loaded with a person weighing (100 ± 5) kg, using the minimum as well as the maximum load, over the full range of exercise motion.

In addition, if applicable, perform exercise(s) that does not involve the user's mass, using the minimum as well as the maximum load, over the full range of exercise motion.

The equipment shall not tip over in either test.

The test person shall not lean or try to influence the balance of the machine.

6.2.2 Test in folded or storage position

Place the equipment, folded according to the user's manual, on a $(10^{+1}_{-0})°$ incline surface.

The equipment shall not tip over in either test.

6.3 External construction

6.3.1 Test of edges and corners

Test by measuring the radius and by visual and tactile examination.

6.3.2 Tube ends

A visual inspection of the unit to verify that all tube ends in the accessible hand and foot area are closed off shall be performed.

The pull-out test shall be performed using a constant force.

6.3.3 Testing of squeeze points and shear points

Perform a dimensional check.

6.3.4 Weights and other resistant means

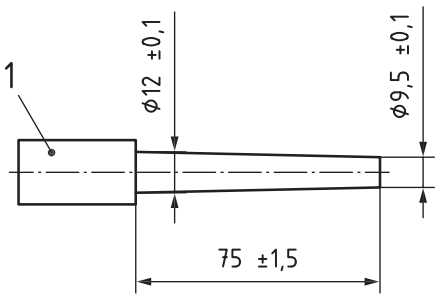
A functional test using the maximum and minimum resistance or weights including added resistance or weights (e.g. incremental weights) shall be carried out over the maximum range of movement.

6.3.5 Testing of pull-in points

6.3.5.1 General

Apparatus: test finger in accordance with Figure 1.

Dimensions in millimetres



Key

1 handle

R_a-value ≤ 0,40 µm

Surface hardness ≥ HRC 40 (hardness Rockwell c-scale)

Figure 1 — Test finger

Approach the pull-in point with the test finger probe in the most onerous direction to determine whether the test finger can become trapped, while the equipment is in normal operation.

6.3.5.2 Pulleys

If guarded, measure the angle between the rope or belt and the guard.

If unguarded, measure the pressure between the pulley and the rope or belt. The test shall be performed with the maximum load.

6.3.5.3 Chains, gears and sprockets

Perform a visual check that guarding prevents access to chains, gears and sprockets.

6.4 Testing of entrapment

A visual and functional test shall be carried out to determine whether or not the user can become entrapped.

6.5 Adjustment components and locking mechanisms

Perform a visual and functional examination before, during and after every test.

6.6 Tests for ropes, belts, chains and attachment components

Measure the tension of the rope, belt or chain as well as the attachment components while statically applying the maximum specified training load. Then perform a tensile test, with 6 times the maximum measured tension for the whole functional system.

6.7 Testing of rope and belt guides

Perform a functional test.

6.8 Testing of integral handgrips

Perform a functional test.

6.9 Testing of applied handgrips

Apply a force of 70 N to the handgrip in the most onerous direction. The load shall be applied for at least 1 minute.

6.10 Testing of rotating handgrips

Perform a functional test.

6.11 Testing of endurance load

Carry out the test per the requirements as described in 5.9 as close as possible to normal exercise frequency and free of shocks:

a) with maximum load;

b) in the direction of the load in accordance with the exercise instructions over 80 % of the possible range of movement;

c) with a frequency of movement simulating normal use.

If the equipment offers multiple exercise stations, the test shall be done with all stations and functions as described in the user's manual.

6.12 Testing of isometric equipment

Measure the static output force or torque of the body in the position(s) as described in the user's manual and compare this value to the displayed value.

Perform the test using the following three values:

— minimum;

— maximum;

— a third random value between these two points.

6.13 Testing of indicator of the heart rate measurement system

Perform a visual test by using the heart rate measurement system.

6.14 Testing of the heart rate control mode

Set the equipment to the heart rate control mode with a target of 120 bpm. Operate the product according to the manufacturer's specifications, then use a heart rate simulator or a person to activate the control mode. Cut off the signal and then check if the resistance or the load reduces according to the requirements shown in 5.11.2. If there is more than one heart rate control system, each system shall be tested.

6.15 Load testing

Carry out the test quasi-statically.

Consider the following when deciding where to apply and distribute the test load F_{test}.

a) Where is the training load typically applied to the product during use?

b) Where is the body weight load typically applied to the product during use?

c) Does the stationary training equipment have multiple configurations for use, and if so, what is the most onerous loading configuration to be tested?

d) Can the stationary training equipment be used for multiple exercises, and if so, are there one or more most onerous conditions that should be tested?

Apply the test load F_{test} to the stationary training equipment in a manner to represent the most onerous position(s) when the equipment is used according to the instructions in the user's manual.

Place the determined load on the stationary training equipment as in normal practice and in a position which imposes greatest strain on the stationary training equipment.

When the load bearing surface is divided, apply the test load to each part in proportion to the total surface area at the same time.

The load should be applied through a load applicator in a way that simulates the situation that occurs when the stationary training equipment is used according to the instructions in the user's manual.

Apply the test load F_{test} to the stationary training equipment for at least 1 min.

Examples are given in Annex A.

6.16 Testing of care and maintenance, assembly instructions, general instructions for use and marking

Verify the information provided by the manufacturer against the equipment being tested.

6.17 Test report

The test report shall include at least the following information:

a) name and address of the testing facility and location where the test was carried out when different from the address of the reporting facility;

b) unique identification of the report (such as serial number), number of each page, and total number of pages of the report;

c) name and address of the client;

d) description and identification of the test item;

e) date of receipt of the test item and date(s) of the performance of the test;

f) identification of the test specification or description of the method or procedure;

g) description of the sampling procedure, where relevant;

h) any deviations, additions or exclusions from the test specification, and any other information relevant to a specific test;

i) measurements, examinations and derived results, supported by tables, graphs, sketches and photographs as appropriate, and any failures identified;

j) statement on the measurement uncertainty (where relevant);

k) signature and title or an equivalent marking of person(s) accepting technical responsibility for the test report and date of issue;

l) statement to the effect that the test results relate only to the items tested.