

Furniture — Links for non-domestic seating linked together in a row — Strength requirements and test methods

The European Standard EN 14703:2007 has the status of a British Standard

ICS 97.140

National foreword

This British Standard was published by BSI. It is the UK implementation of EN 14703:2007.

The UK participation in its preparation was entrusted to Technical Committee FW/0, Furniture.

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

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 May 2007

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ISBN 978 0 580 50700 7

Amendments issued since publication

Amd. No.	Date	Comments

English Version

Furniture - Links for non-domestic seating linked together in a row - Strength requirements and test methods

Ameublement - Assemblages pour sièges à usage non domestique assemblés en une rangée - Exigences de résistance et méthodes d'essai

Möbel - Verbindungselemente für Reihenbestuhlung für den Nicht-Wohnbereich - Festigkeitsanforderungen und Prüfverfahren

This European Standard was approved by CEN on 15 March 2007.

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Foreword

This document (EN 14703:2007) has been prepared by Technical Committee CEN/TC 207 "Furniture", the secretariat of which is held by UNI.

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of an identical text or by endorsement, at the latest by October 2007, and conflicting national standards shall be withdrawn at the latest by October 2007.

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1 Scope

This European Standard specifies strength requirements and test methods for the links used for non-domestic seating, which can be linked together in a row.

This European Standard does not specify strength or durability requirements for individual chairs as these are contained within EN 15373.

Assessment of ageing and degradation is not included.

Tests carried out according to this European Standard are intended to demonstrate the ability of the links to function correctly in their intended environment. It should be understood that fulfilling the requirements does not ensure that the links will operate as expected in circumstances or emergencies that cannot be foreseen.

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.

Not applicable

3 Terms and definitions

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

3.1
linked seating
single chairs fitted with means whereby they can be linked together in a row or separated and used singly or stored.

NOTE Seating mounted on beams or fixed to the floor or wall of a building is not linked seating

3.2
positive links
links which remain linked if the chairs are overturned or lifted up

3.3
gravity links
links which link each chair to the previous one when the chair is put down. This type of link will disengage when the chair is lifted up

3.4
structure
load bearing parts of furniture including the frame, seat, back, arm supports and suspension

3.5
static test
test consisting of heavy loads being applied a few times to ensure that the furniture has sufficient strength to perform its function under the highest levels of loading that might reasonably be expected to occur

3.6
impact test
test to assess the strength of the article under the rapid rates of loading that occasionally occur

4 Principle of link performance

There are two options for the performance of chair links subjected to heavy loads:

- a) chairs shall stay linked (7.3.1 option A), or
- b) chairs shall disengage (7.3.1 option B).

5 General test conditions

5.1 General

The tests are designed to be applied to linked seating that is fully assembled and ready for use.

The tests consist of the application, to various parts of the item, of loads or forces simulating normal functional use and foreseeable emergency situations.

The tests are designed to evaluate properties without regard to materials, design/construction or manufacturing processes.

The test results are only valid for the article tested. When the test results are intended to be applied to other similar articles, the test specimen shall be representative of the production model.

In the case of designs not catered for in the test procedures, the test shall be carried out as far as possible as described, and deviations from the test procedure recorded in the test report.

5.2 Preliminary preparation

The furniture shall be tested as delivered. Knock-down furniture shall be assembled according to the instructions supplied with it.

The furniture shall be assembled and/or configured according to the instructions supplied. If the furniture can be assembled or combined in different ways, the most adverse combination shall be used for each test. Knock-down fittings shall be tightened before testing and further tightening shall not take place unless specifically required by the manufacturer.

The tests shall be carried out in indoor ambient conditions but if during a test the atmospheric temperature is below 15 °C or above 25 °C the maximum and/or minimum temperature shall be recorded in the test report.

5.3 Application of forces

Unless otherwise stated static loads shall be maintained for a period of (10 ± 2) s.

5.4 Tolerances

For tolerances, unless otherwise stated:

- forces shall have an accuracy of ± 5 % of the nominal force;
- masses an accuracy of $\pm 0,5$ % of the nominal mass;
- dimensions an accuracy of $\pm 1,0$ mm of the nominal dimension.

The tolerance for the positioning of loading pads shall be ± 5 mm.

Forces may be replaced by masses. The relationship $1 \text{ kg} = 10 \text{ N}$ shall be used for this purpose.

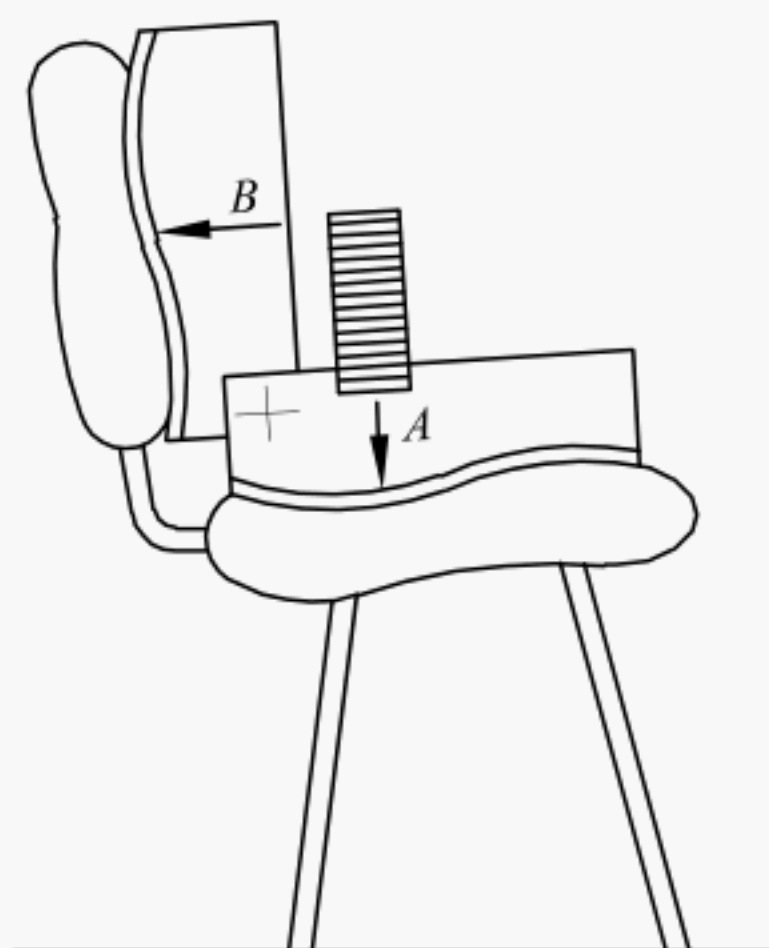
6 Test equipment and apparatus

6.1 General

The tests may be applied by any suitable device because results are dependent only upon correctly applied loads and not upon the apparatus, except in the case of impact tests where the apparatus described in 6.5 shall be used.

The equipment shall not inhibit the deformation of the chair during testing. It shall be able to move so that it can follow the deformation of the chair during testing, so that the loads are always applied at the specified point and in the specified direction.

All loading pads shall be capable of pivoting in relation to the direction of the applied force and the pivot point shall be as close as practically possible to the load surface.

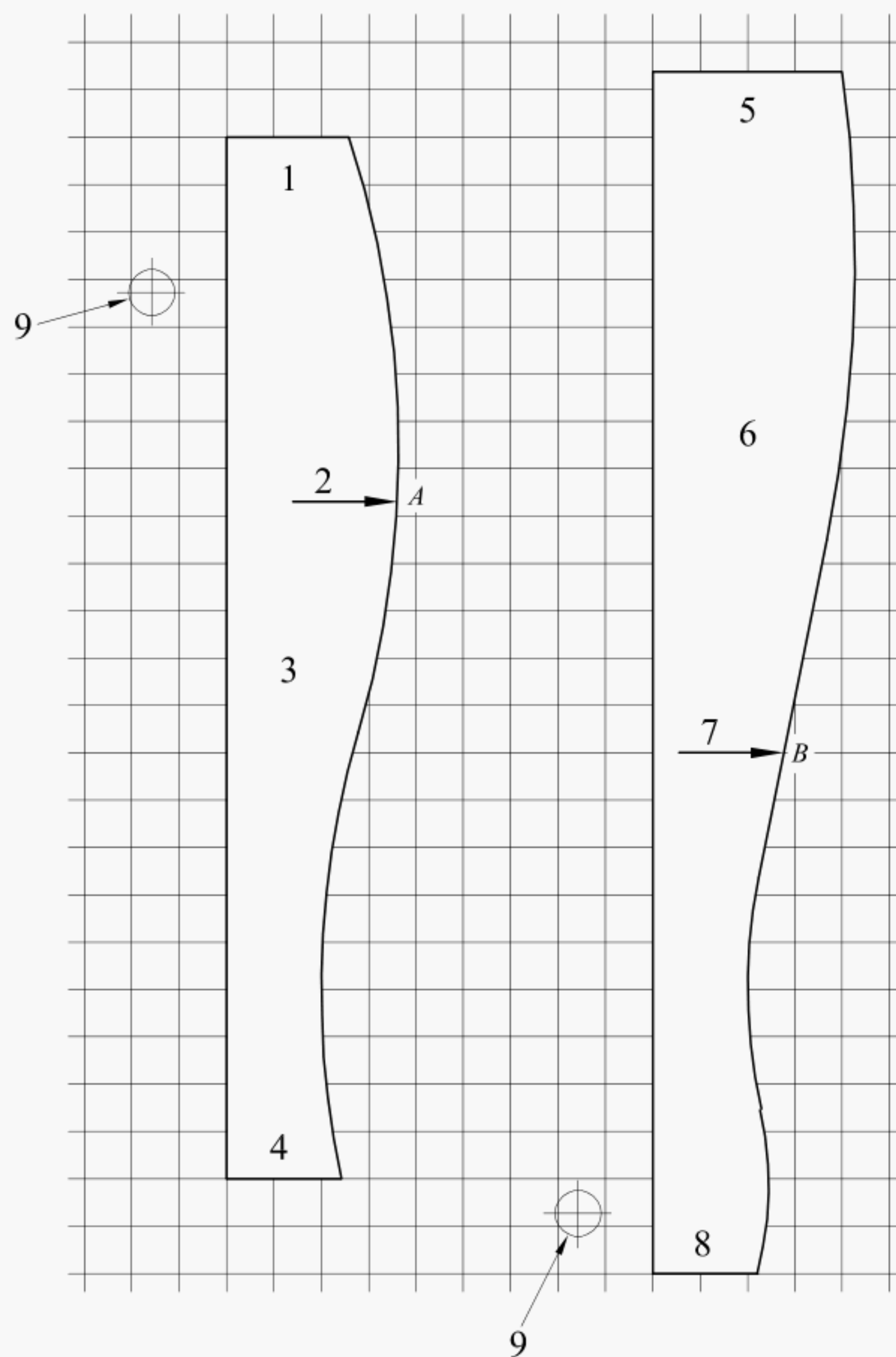


Key

A seat load

B back load

Figure 1 — Position of loading point template



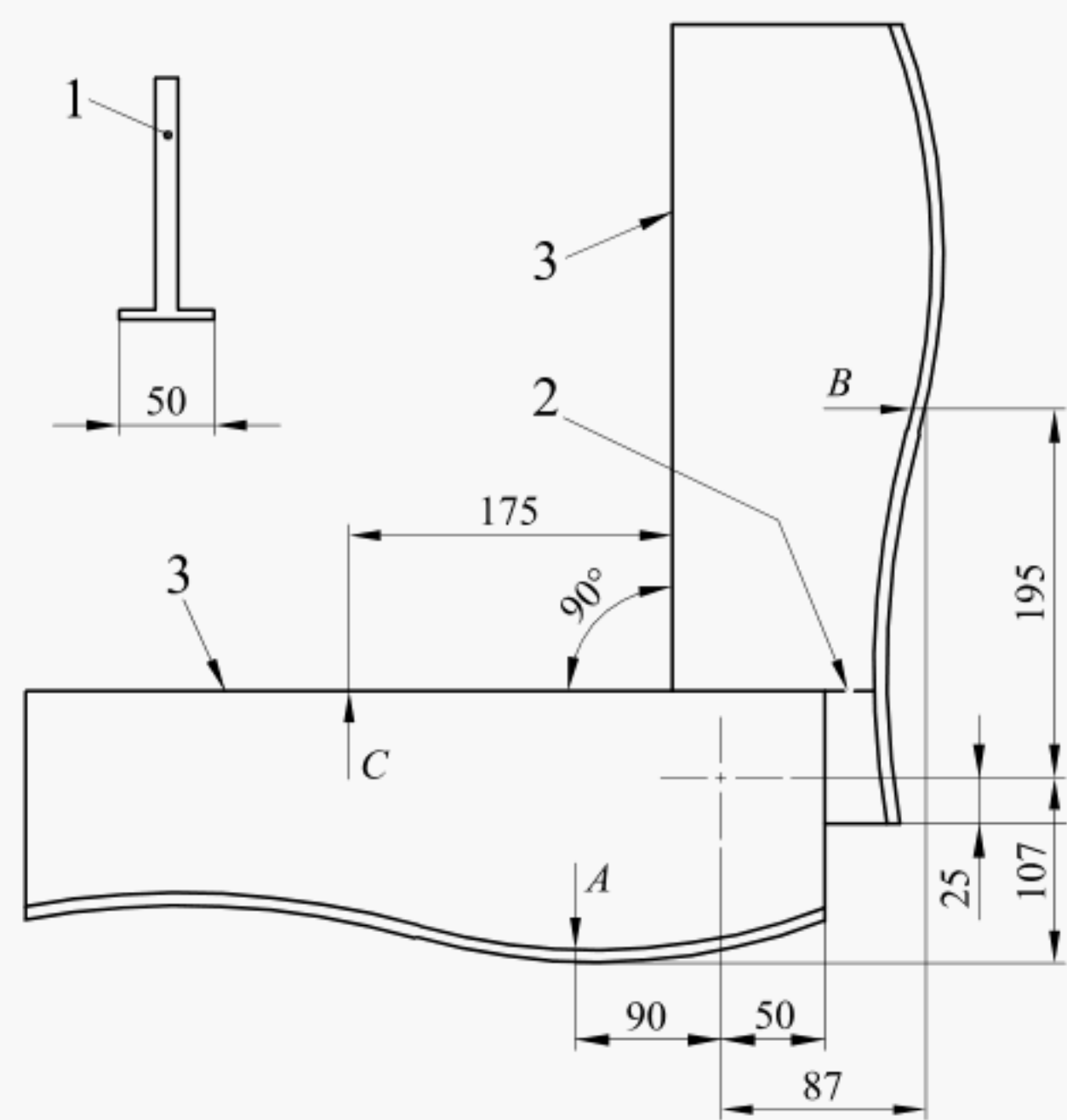
Key

Scale: 1 square = 20 mm

- | | |
|---|--------------|
| 1 | rear |
| 2 | seat load |
| 3 | seat portion |
| 4 | front |
| 5 | top |
| 6 | back portion |
| 7 | back load |
| 8 | bottom |
| 9 | pivot point |

Figure 2 — Loading surface curves for seat and back loading point template

Dimensions in millimetres



Key

- A seat load
- B back load
- 1 typical section
- 2 mark to fix 90°
- 3 straight edge for determination of seat or back inclination

Figure 3 — Loading point template

6.2 Floor, horizontal, flat and rigid with a smooth surface.

6.3 Stops, to prevent the article from sliding but not tilting, no higher than 12 mm except in cases where the design of the item necessitates the use of higher stops, in which case the lowest that will prevent the item from sliding shall be used.

6.4 Local loading pad, (i.e. for loading tops of backs or fronts of seats), rigid cylindrical object 100 mm in diameter, with a flat face and a 12 mm edge radius.

6.5 Foam for use with loading pads, 25 mm thick layer of flexible foam with a bulk density of (120 ± 25) kg/m³. The foam shall be attached to the faces of the loading pads or alternatively positioned between the loading pad and the test structure.

6.6 Horizontal impact device, consisting of a WBA standard basketball size 5, (see Note 1), inflated to a pressure of $(73,5 \pm 5)$ kPa and attached by a network of elastic cords to the ball mounting ring. The ball seating shall consist of a ring of timber (or timber derivative) having an outside diameter of 150 mm and an inside diameter of 90 mm. Its rear face shall be attached to the main body of the impactor and its front face shaped to fit the ball.

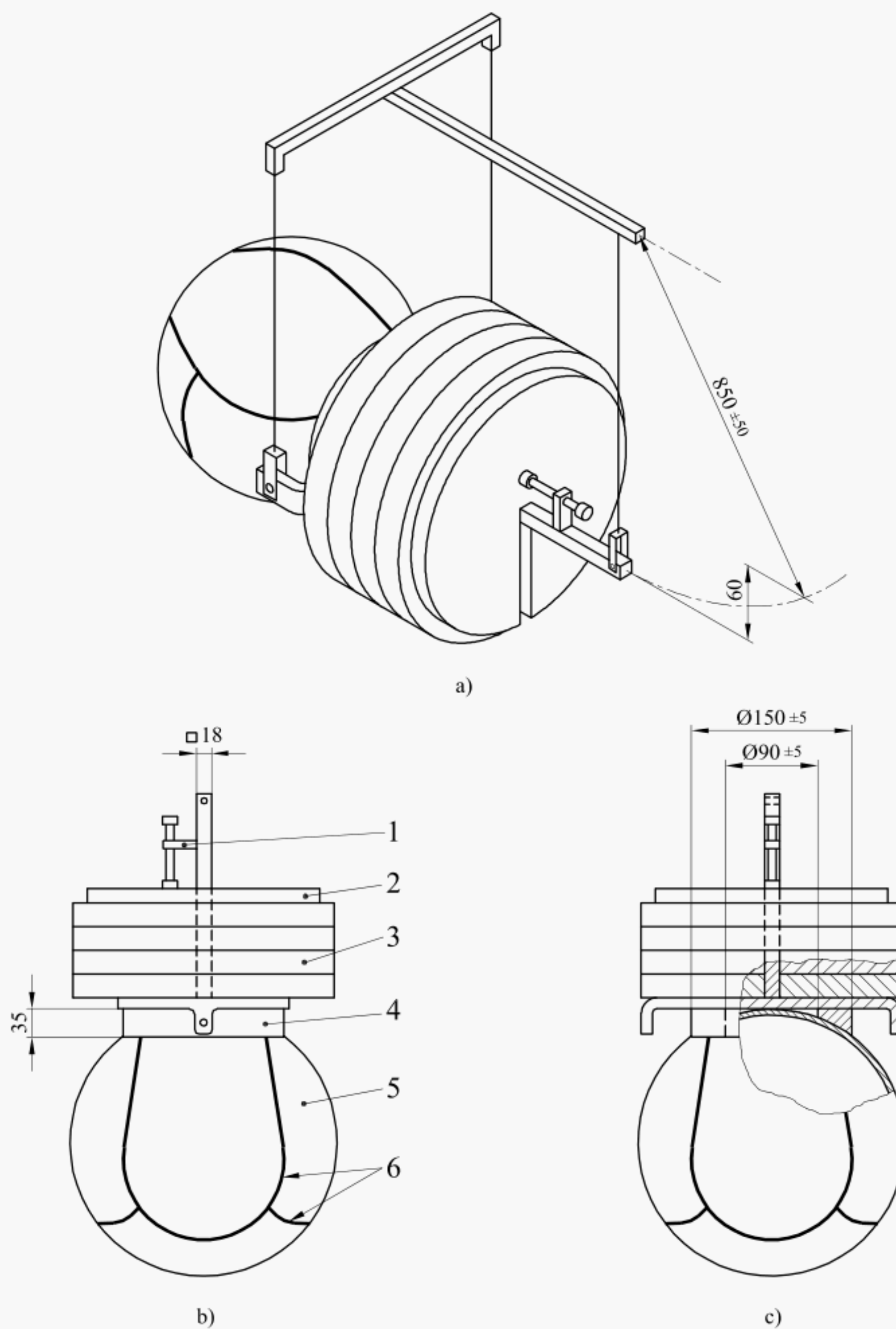
The main body of the impactor shall consist of a mass supported by cords or flexible wires 850 mm long so that the longitudinal axis of the ball, mounting ring and main body assembly shall remain horizontal when the support cords are displaced from the vertical.

The main body of the impactor shall be of such a mass that the total mass of all moving parts, excluding the support cords, shall be 50 kg.

The impactor is illustrated in Figure 4.

NOTE Basketballs approved by the WBA should be marked as such on the product.

Dimensions in millimetres

**Key**

- a) general view
- b) suggested construction
- c) detail of ball mounting ring
- 1 safety clamp
- 2 mass
- 3 disc weights
- 4 ball mounting ring
- 5 basketball
- 6 elastic cords

Figure 4 — Horizontal impact device

7 Test procedure

7.1 General

Whenever a loading pad (6.4) is used a layer of foam (6.5) shall be placed between the pad and the chair structure.

7.2 Row displacement test

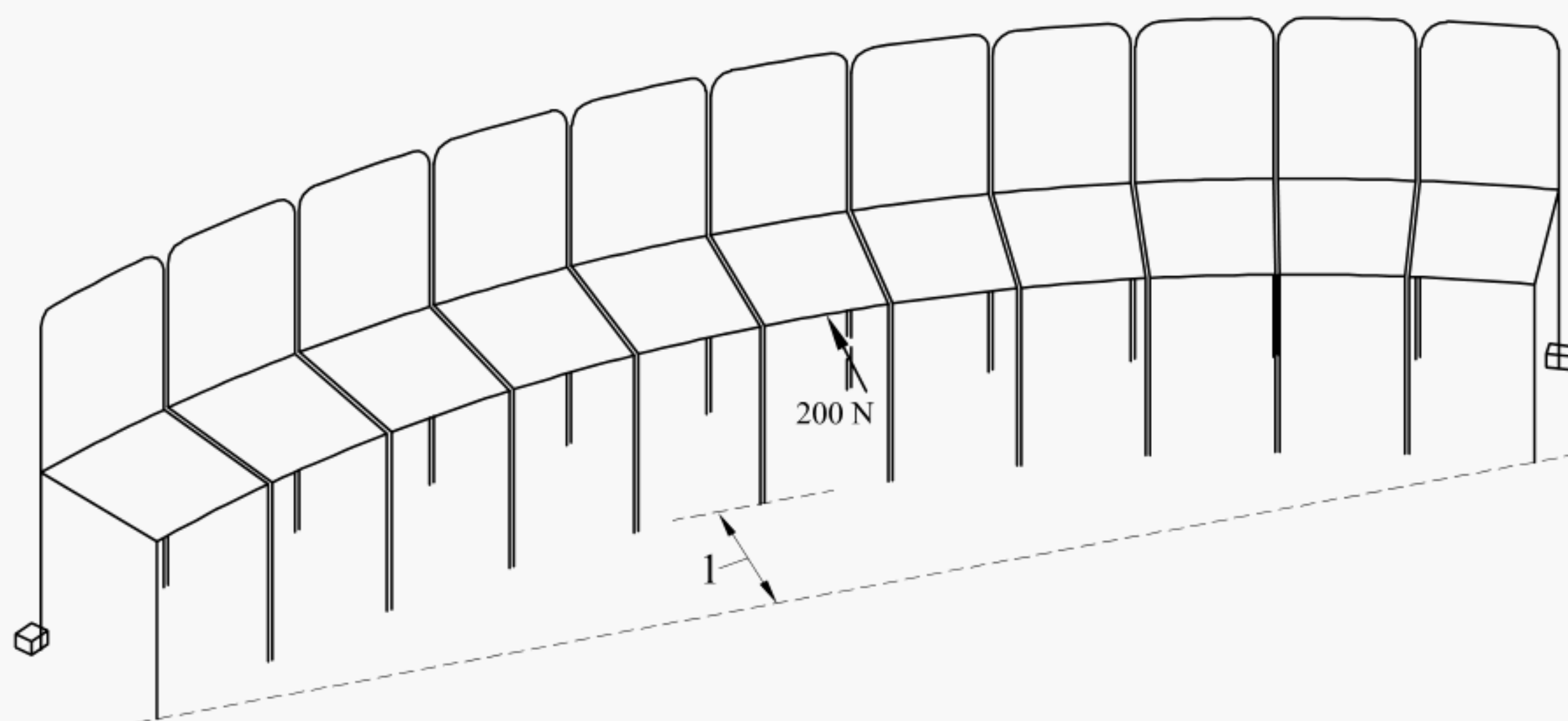
The test shall be carried out on an assembly of eleven chairs linked together.

Stops (6.3) shall be placed so as to prevent forward or rearward movement of the two end chairs. If necessary sufficient weight to prevent the row from overturning shall be shared equally on the two end seats only.

Apply a horizontal force of 200 N rearwards to the centre of the front edge of the seat structure of the central seat – measure the distance from the front legs at the centre of the row to a line joining the front legs at the end of the row (see Figure 5).

Repeat the procedure with horizontal forward force of 200 N applied to the rear edge of the seat structure of the central seat.

The displacement of the centre point of a row shall not be greater than 200 mm rearward or 200 mm forwards from the straight line (or the nominal radius of circumference when the links are designed to hold the chairs in a curved row rather than a straight row).



Key

- 1 rearwards displacement

Figure 5 — Row Displacement Test (rearwards displacement shown)

7.3 Link strength

7.3.1 General

These tests relate to the performance of links in an emergency situation. When tested according to 7.3.2 and 7.3.3 the links shall satisfy the same option in both tests. The links shall either fulfil the requirements of Option A or Option B as follows: (see Clause 4).

Option A

The linking mechanism and the chair structure may be damaged in this test, but the row shall remain intact.

Option B

At least one chair shall become disengaged from another.

7.3.2 Overturning test

The test shall be carried out on an assembly of eleven chairs linked together.

Stops (6.3) shall be placed to prevent forward and rearward movement of the two end chairs only.

Apply force rearwards to the centre of the top of the back of the central seat sufficiently large to overturn the row.

Repeat the procedure with a force forwards to the centre of the top of the back of the central seat sufficiently large to overturn the row.

7.3.3 Horizontal impact test

The test shall be carried out on an assembly of five chairs linked together.

Stops (6.3) shall be placed so as to prevent forward or rearward movement of the two end chairs only.

160 kg shall be placed on both of the two end seats.

Position the horizontal impact device (6.6) so that it just touches the impact point when hanging at rest.

Apply a rearward horizontal impact at the centre of the seat front edge of the central seat (see Figure 6).

The impactor shall drop through a height of 60 mm and a total of 10 impacts shall be applied.

Repeat with a horizontal impact ten times forwards to the centre of the top edge of the back structure of the central seat.

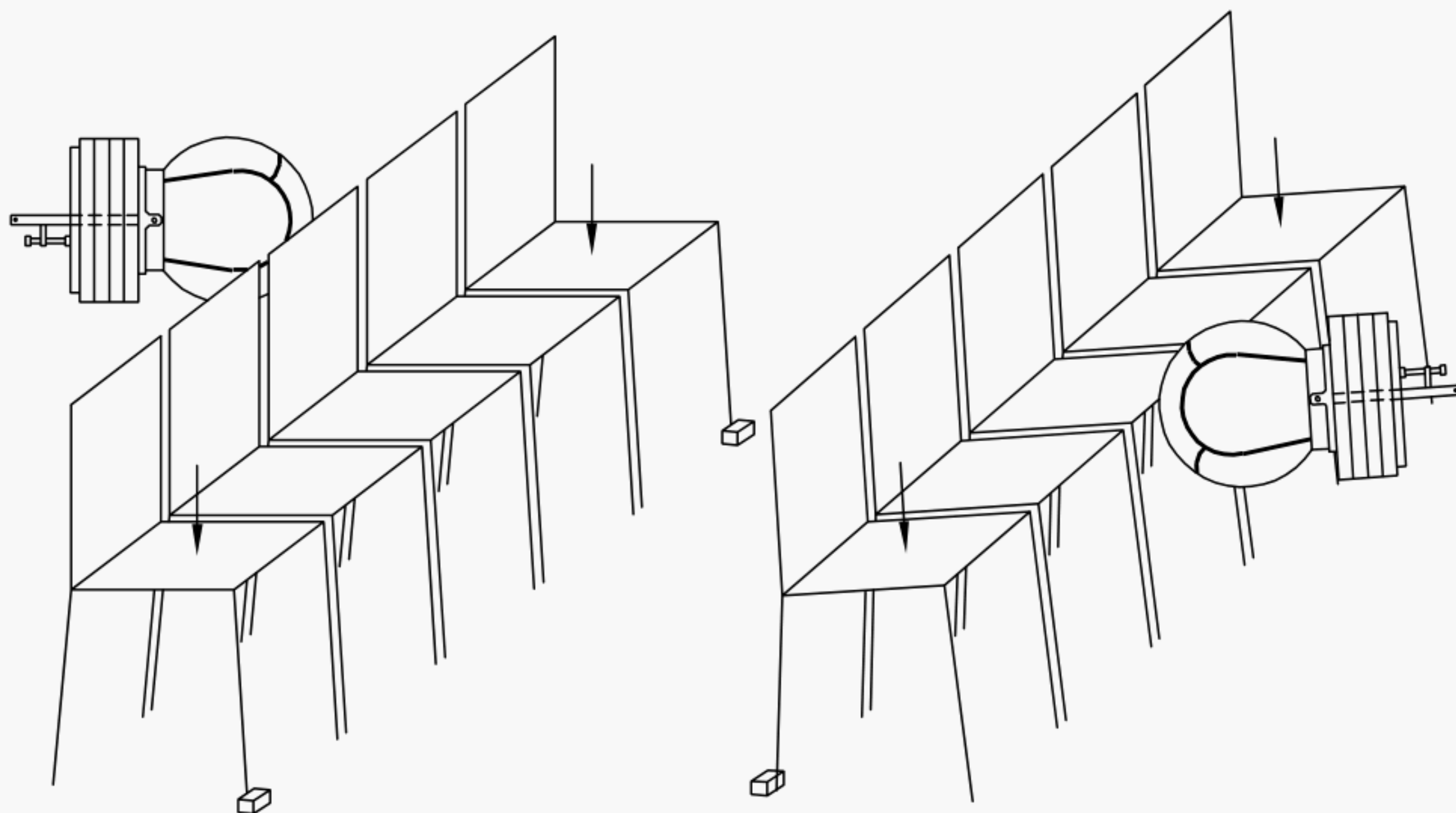


Figure 6 — Horizontal impact test

8 Test report

The test report shall include the following information:

- a) reference to this European Standard, i.e. EN 14703;
- b) type of chair tested and details of the links;
- c) test results;
- d) type of link according to 3.1, 3.2, Clause 4 and 7.3.1;
- e) details of any deviations from this European Standard;
- f) name and address of the test facility;
- g) date of test.

Bibliography

- [1] EN 15373, *Furniture — Strength, durability and safety — Requirements for non-domestic seating*

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