INTERNATIONAL STANDARD

ISO 7174-2

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Furniture — Chairs — Determination of stability —

Part 2:
Chairs with tilting or reclining mechanisms when fully reclined, and rocking chairs

Chaises — Détermination de la stabilité —

Partie 2: Chaises inclinables ou avec mécanisme d'inclinaison complète jusqu'en position de chaise longue, et chaises à bascule

Reference number
ISO 7174-2:1992(E)

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.

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.

International Standard ISO 7174-2 was prepared by Technical Committee ISO/TC 136, *Furniture*, Sub-Committee SC 1, *Test methods*.

ISO 7174 consists of the following parts, under the general title *Furniture — Chairs — Determination of stability*:

— *Part 1: Upright chairs and stools*

— *Part 2: Chairs with tilting or reclining mechanisms when fully reclined, and rocking chairs*

Annex A of this part of ISO 7174 is for information only.

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Furniture — Chairs — Determination of stability —

Part 2:

Chairs with tilting or reclining mechanisms when fully reclined, and rocking chairs

1 Scope

This part of ISO 7174 describes methods for determining the rearward stability of chairs with tilting, reclining and adjustable back angle mechanisms when they are fully tilted or reclined, and of rocking chairs.

Forward and sideward stability of these chairs and of upright chairs is determined by methods described in ISO 7174-1. This part of ISO 7174 describes test methods only for the rearward stability of chairs when fully tilted or reclined, and should not be considered as an alternative test for upright chairs.

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 should be representative of the production model.

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

NOTE 1 This International Standard is one of a series being prepared on the strength, durability and stability of furniture. The series currently consists of the International Standards listed in annex A.

2 Normative reference

The following standard contains provisions which, through reference in this text, constitute provisions of this part of ISO 7174. At the time of publication, the edition indicated was valid. All standards are subject to revision, and parties to agreements based on this part of ISO 7174 are encouraged to investigate the possibility of applying the most recent edition of the standard indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 7174-1:1988, *Furniture — Chairs — Determination of stability — Part 1: Upright chairs and stools.*

3 Definition

For the purposes of this part of ISO 7174, the following definition applies.

3.1 stability: Ability to withstand forces that tend to cause the article to overturn. (ISO 7174-1:1988)

4 Representation of test person

The test methods are representative of a person sitting with arms stretched out or behind the head and legs under the chair, which is considered to be the configuration of the human form most likely to cause instability in chairs.

The test apparatus represents a person of 110 kg mass and a stature of 190 cm; therefore the test allows for normal dynamic loads generated by persons of less extreme size. The tests do not cover such dynamic activities as the sitter pushing the chair across the floor or tilting the chair violently.

5 Test equipment

5.1 Loading discs, with a mass of 10 kg each, diameter 350 mm and thickness 48 mm.

NOTE 2 For practical reasons this is the preferred test method but the development of apparatus representing the person [described in clause 4, see figure 2 a)] more realistically is considered desirable.

5.2 Support apparatus, to support the main stack of discs in reclining chair tests. It should be as light as possible and not heavier than 2,5 kg.

The apparatus shown in figure 1 is suggested as a possible basic design for the disc stack support apparatus.

5.3 Floor surface, horizontal, flat and rigid.

6 Conditioning

No prior conditioning of the article is required.

7 General test requirements

7.1 Positioning

For tests on articles with swivelling bases, rotate the base to the position relative to the seat that is most likely to cause overbalancing.

Tighten any assembly fittings.

Set adjustable-height chairs to the height that is most likely to cause overturning.

7.2 Tolerances

Unless otherwise stated, all forces shall have an accuracy of $\pm$ 5%, all masses an accuracy of $\pm$ 0,5% and all dimensions an accuracy of $\pm$ 0,5 mm.

8 Test procedures

8.1 Tilting chairs

For tilting chairs, this test is not required when the minimum value of φ is greater than 55° [see figure 2 a)].

Dimensions in millimetres

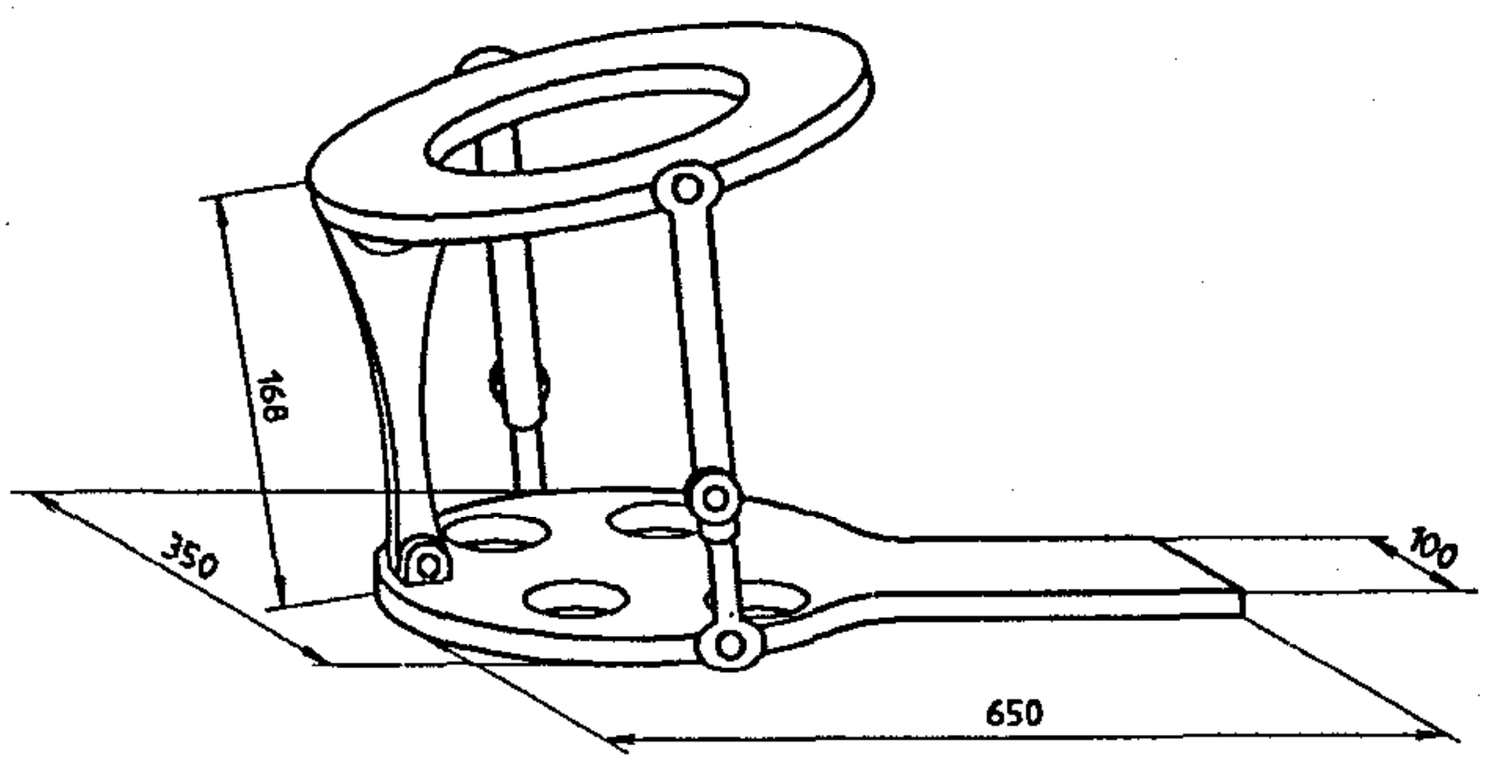
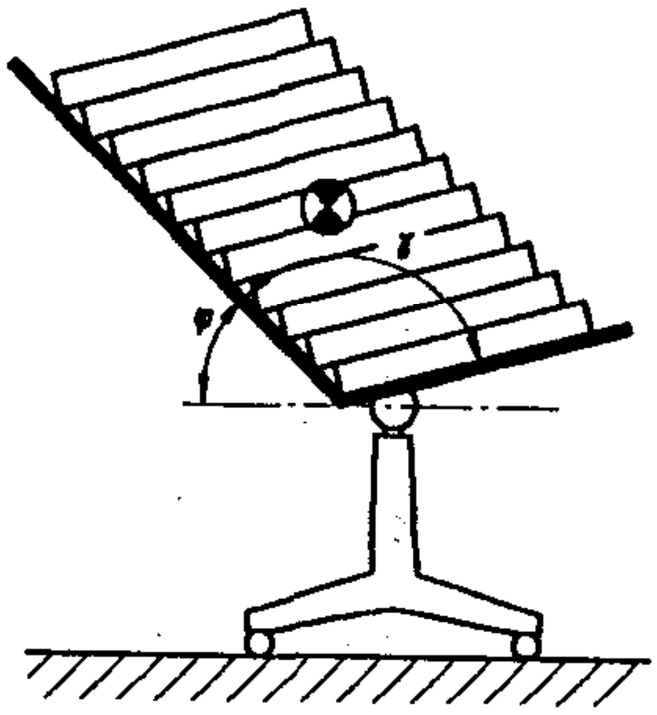
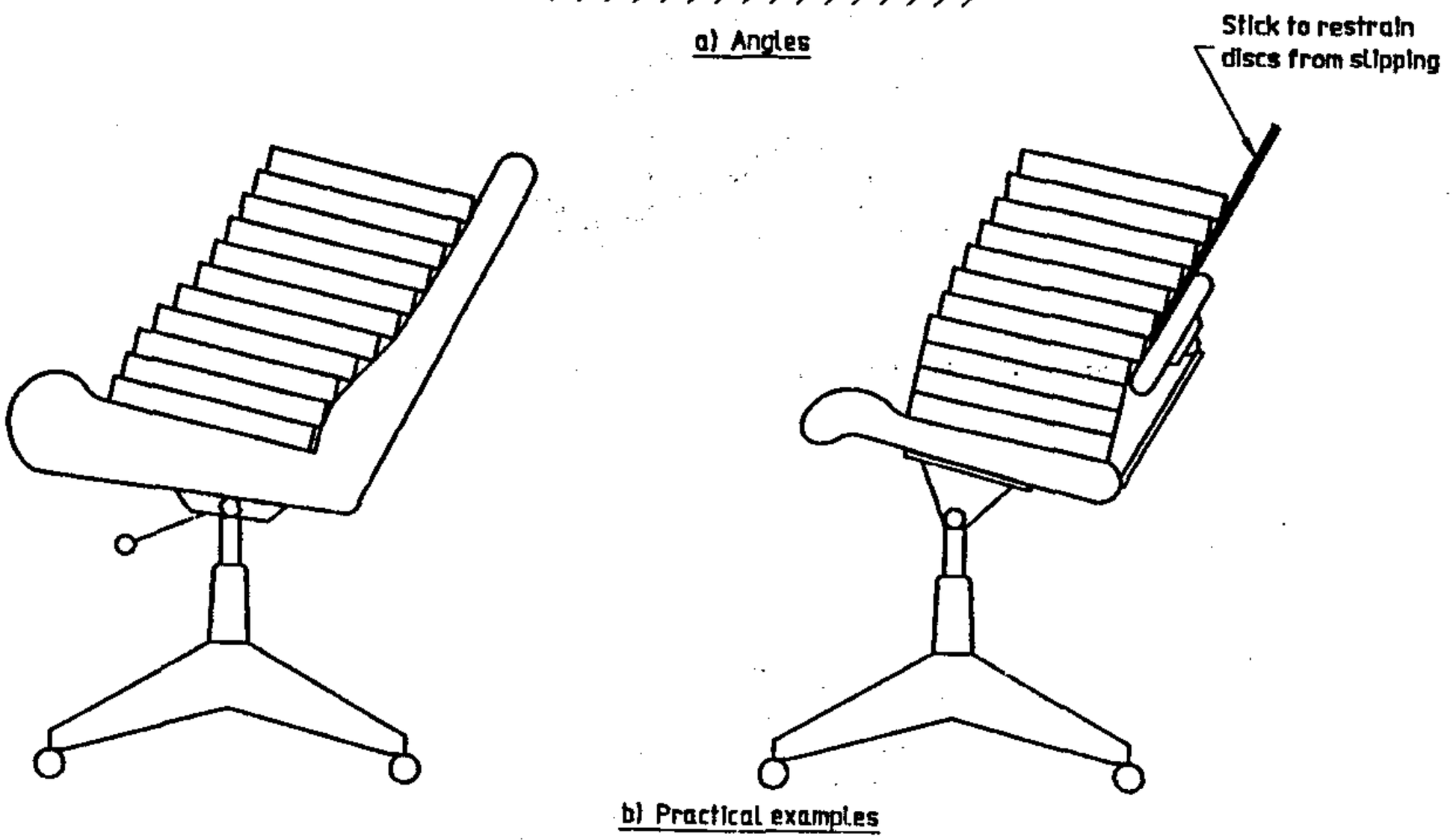


Figure 1 — Suggested disc stack support apparatus



a) Angles



b) Practical examples

Figure 2 — Method for tilting chairs

This test method is valid for all values of φ and values of γ between 90° and 120° (i.e. error in representing standard figure not greater than 1 % of stature).

Load the chair with 11 discs (5.1) so that the discs are firmly settled using the support apparatus (5.2) against the chair back as shown in figure 2 b).

Report whether or not the chair overbalances.

8.2 Rocking chairs

This test method is valid for all values of φ and values of γ between 90° and 120° (i.e. error in representing standard figure not greater than 1 % of stature).

Load the chair with 11 discs (5.1) so that the discs rest against the chair back. Secure the discs to the chair back with the support apparatus (5.2) against the chair back as shown in figure 2 b).

Rock the chair forward as far as is practicable or until the back support surface is vertical (see figure 3).

Allow the chair to rock rearward freely under gravity (see figure 4).

Report whether or not the chair overbalances.

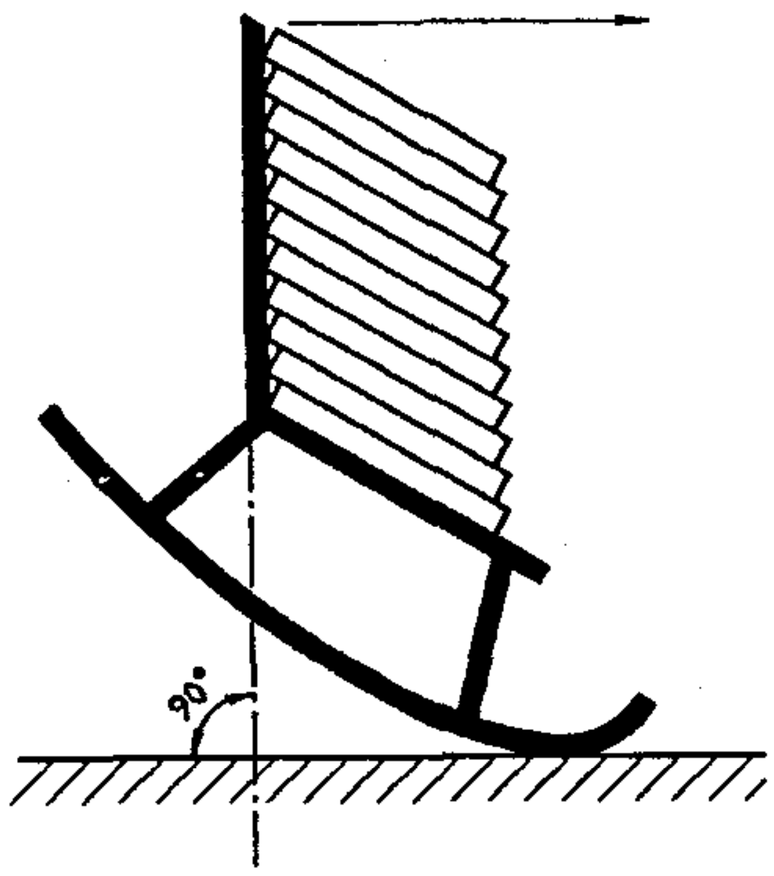


Figure 3 — Method for rocking chairs — Rock forwards

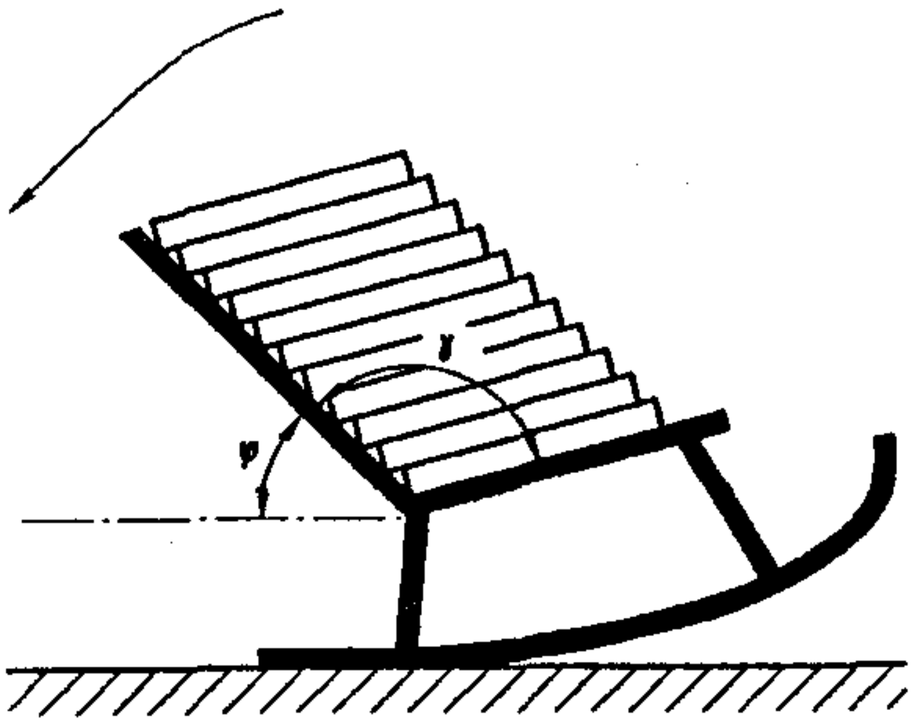


Figure 4 — Method for rocking chairs — Rock freely rearwards

8.3 Reclining chairs with footrests

For reclining chairs with footrests, the test is not required when the minimum value of φ is greater than 45° (see figure 5).

Preferred values of β are less than 15° (see figure 5).

Table 1 — Distance l_1 in relation to φ

φ	l_1 mm
0°	614
10°	564
20°	515
30°	464
45°	392

8.3.1 Test of chair part

Load the back of the chair with eight discs (5.1) and place three discs onto the footrest (see figure 5) at distance l_1 from the intersection of the seat and back (see table 1).

A practical suggestion for loading the chair using the support apparatus (5.2) is shown in figure 6.

Report whether or not the chair overbalances.

8.3.2 Footrest test

In most cases the stability of a reclining chair when someone is applying an undue proportion of his mass to the footrest cannot be tested because the footrest folds up. Therefore, the normal forward stability test given in ISO 7174-1 shall be applied with the footrest in the folded condition only.

Dimensions in millimetres

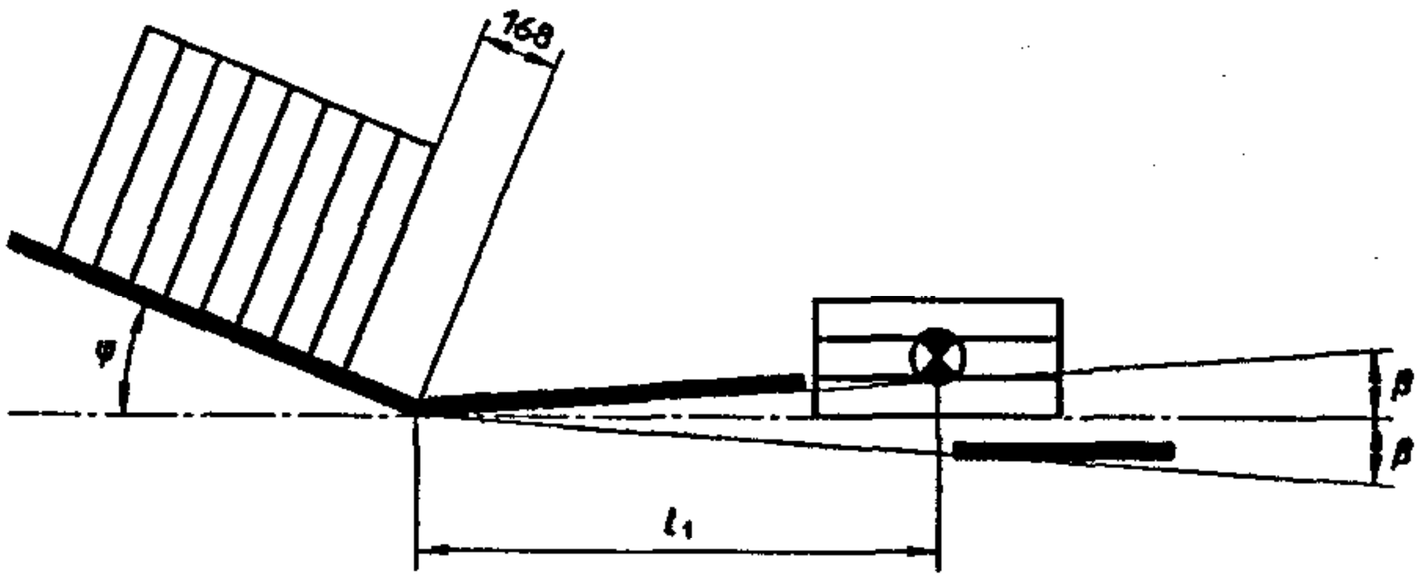


Figure 5 — Method for reclining chairs with footrest

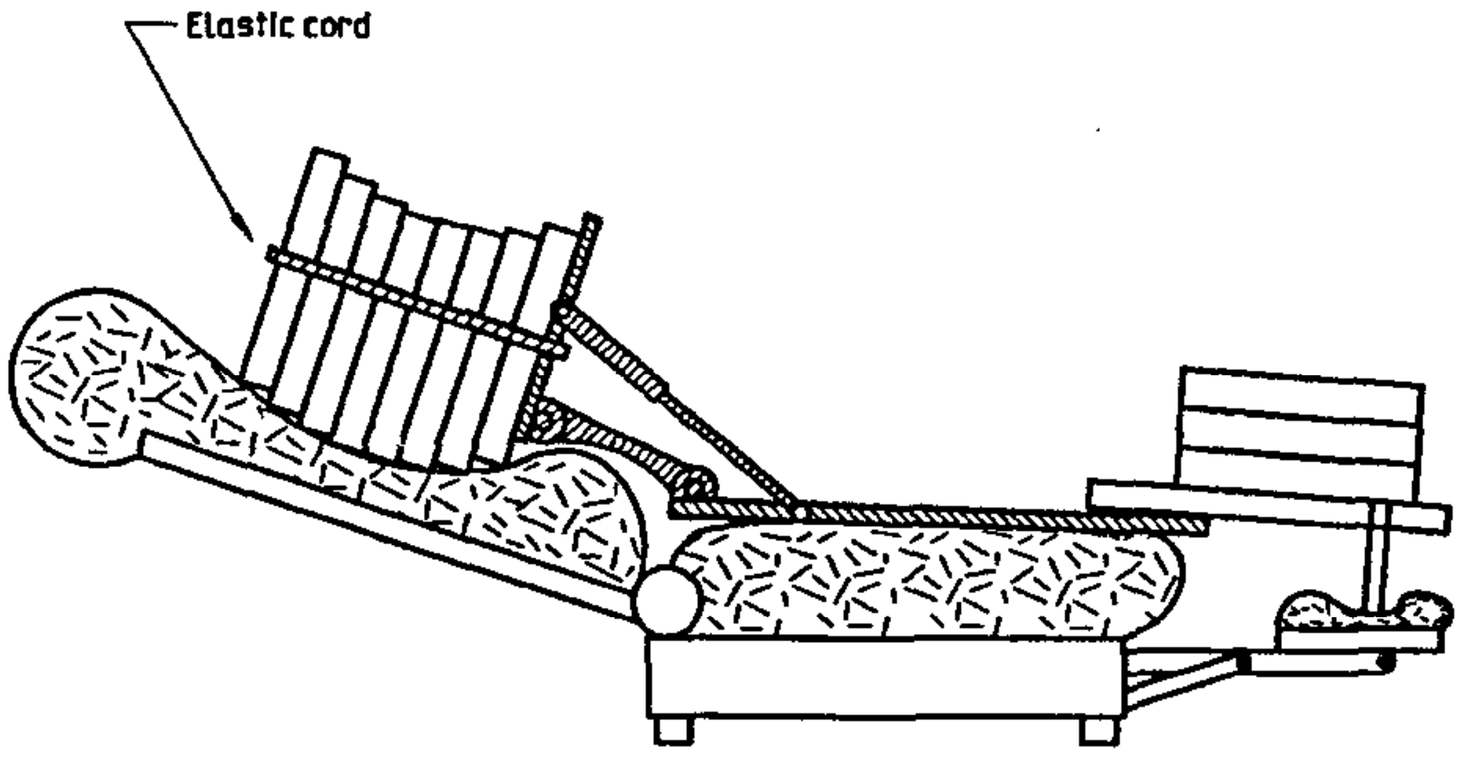


Figure 6 — Reclining chairs with footrest — Practical example using suggested support apparatus

However, in those cases where the footrest does not fold as the sitter's mass is moved towards the footrest (e.g. lever-operated chairs), the normal forward stability test given in ISO 7174-1 shall be applied to the footrest in its fully extended position.

8.4 Reclining chairs without footrests

For reclining chairs without footrests, this test is not required when the minimum value of φ is greater than 55° (see figure 7).

Preferred values of β are less than 15° (see figure 7).

Dimensions in millimetres

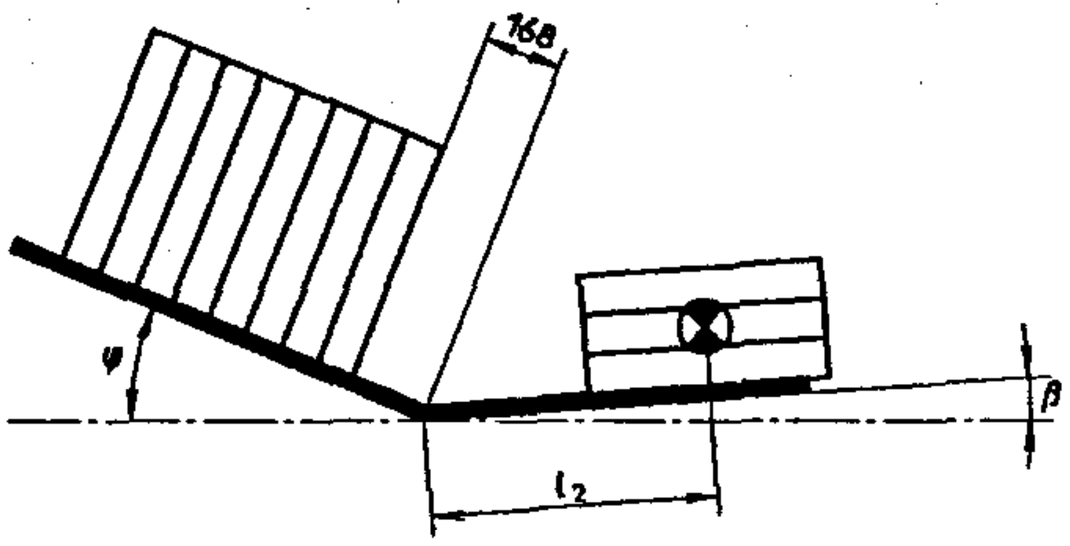


Figure 7 — Method for reclining chairs without footrest

Load the back of the chair with eight discs (5.1), and place three discs on the front of the seat of the chair (see figure 7) at distance l_2 from the intersection of the seat and back (see table 2).

Table 2 — Distance l_2 in relation to φ

φ	l_2 mm
0°	474
10°	424
20°	375
30°	325
45°	252
60°	194

A practical suggestion for loading the chair using the support apparatus (5.2) is shown in figure 8.

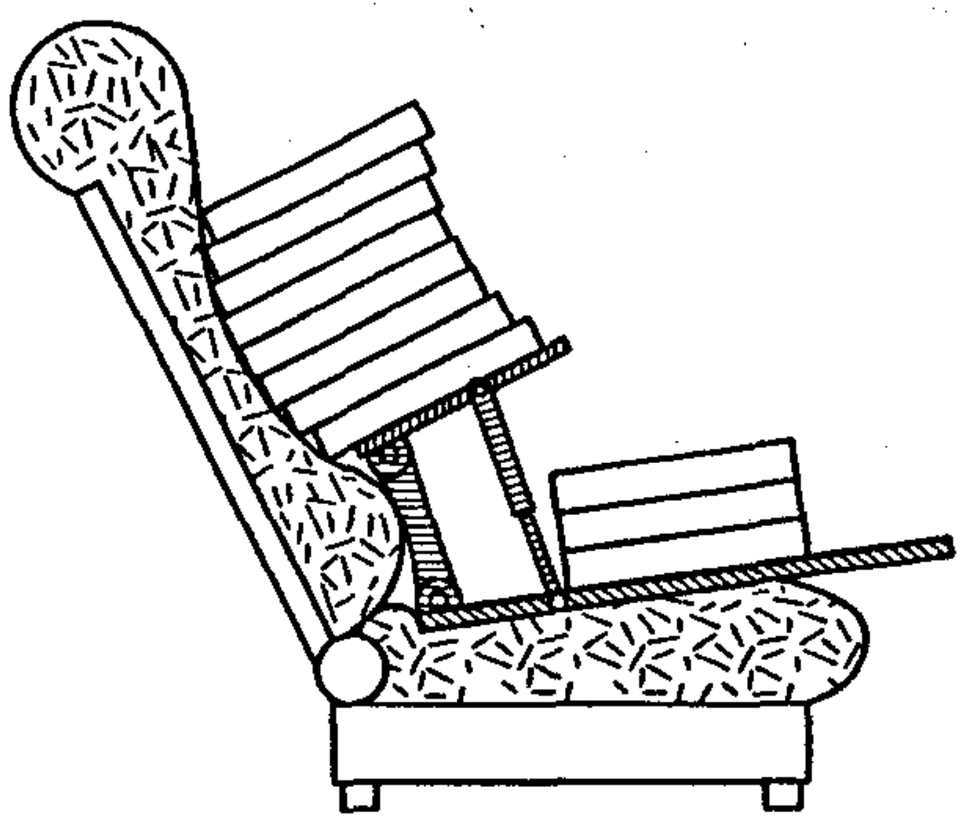


Figure 8 — Reclining chairs without footrest — Practical example using suggested support apparatus

Report whether or not the chair overbalances.

9 Test report

The test report shall include at least the following information;

a) a reference to this part of ISO 7174;

b) the piece of furniture tested (relevant data);

c) the test results: overbalance/not overbalance;

d) details of any deviations from this part of ISO 7174;

e) the name and address of the test facility;

f) the date of test.

Annex A
(informative)

Bibliography

[1] ISO 7170:—[1], *Furniture — Storage units — Test methods for the determination of strength and durability.*

[2] ISO 7171:1988, *Furniture — Storage units — Determination of stability.*

[3] ISO 7172:1988, *Furniture — Tables — Determination of stability.*

[4] ISO 7173:1989, *Furniture — Chairs and stools — Determination of strength and durability.*

[5] ISO 7174-1:1988, *Furniture — Chairs — Determination of stability — Part 1: Upright chairs and stools.*

[6] ISO 7174-2:1992, *Furniture — Chairs — Determination of stability — Part 2: Chairs with tilting or reclining mechanisms when fully reclined, and rocking chairs.*

[7] ISO 8019:—[1], *Furniture — Tables — Determination of strength and durability.*

1) To be published.

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