
Foldaway beds — Safety requirements and tests —

Part 2:
Test methods

Lits rabattables — Exigences de sécurité et essais —
Partie 2: Méthodes d'essai
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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.

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 10131-2 was prepared by Technical Committee ISO/TC 136, *Furniture*, Subcommittee SC 1, *Test methods*.

ISO 10131 consists of the following parts, under the general title *Foldaway beds — Safety requirements and tests*:

- *Part 1: Safety requirements*
- *Part 2: Test methods*

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Introduction

This part of ISO 10131 describes a number of tests consisting of the application, to various parts of the bed, of loads or forces simulating normal functional use, as well as misuse that can reasonably be expected to occur.

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

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Foldaway beds — Safety requirements and tests —

Part 2: Test methods

1 Scope

This part of ISO 10131 specifies test methods to assess the safety of foldaway beds for domestic use.

The tests are designed to be applied to a foldaway bed that is fully assembled and ready for use.

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 should be carried out as far as possible as described, and a list made of the deviations from the test procedure.

Folding beds, camping beds, convertible bed/chairs or settees are not covered by this part of ISO 10131.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 10131. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 10131 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 554:1976, *Standard atmospheres for conditioning and/or testing — Specifications.*

ISO 2439:—¹⁾, *Flexible, cellular polymeric materials — Determination of hardness (indentation technique).*

ISO 10131-1:1997, *Foldaway beds — Safety requirements and tests — Part 1: Safety requirements.*

3 General test requirements

All forces shall have an accuracy of $\pm 5\%$, all masses an accuracy of $\pm 0,5\%$ and all dimensions an accuracy of ± 1 mm.

Before any of the tests described in this part of ISO 10131 are commenced, the bed shall be old enough to ensure that it has developed its full strength. At least four weeks under normal indoor conditions shall have elapsed between manufacture and testing in the case of glued joints in timber and the like.

Immediately before testing, the bed shall be stored for at least one week in a standardized atmosphere with a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) % in accordance with ISO 554.

1) To be published. (Revision of ISO 2439:1980)

The bed shall be tested as delivered. If of knock-down type, it shall be assembled in accordance with instructions supplied. If the bed 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.

In the case of beds with adjustable characteristics, the test shall be carried out at both ends of the adjustment range.

4 Test equipment

4.1 General

The test forces may, unless otherwise stated, be applied by any suitable device because results are dependent only upon correctly applied forces and loads and not upon the apparatus.

4.2 Loading pad

This shall be a rigid circular object, 200 mm in diameter, the face of which has a convex spherical curvature of 300 mm radius with a 12 mm front edge radius (see figure 1).

4.3 Test mattress

This shall be a flexible polyether foam sheet with a thickness of 100 mm, a bulk density of $(30 \pm 2) \text{ kg/m}^3$ and an indentation hardness index of $(170 \pm 20) \text{ N}$ in accordance with A 40 of ISO 2439, and shall be at least $800 \text{ mm} \times 800 \text{ mm}$ in area but not larger than the mattress base of the bed under test. The test mattress shall have no cover.

4.4 Stops

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

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Dimensions in millimetres

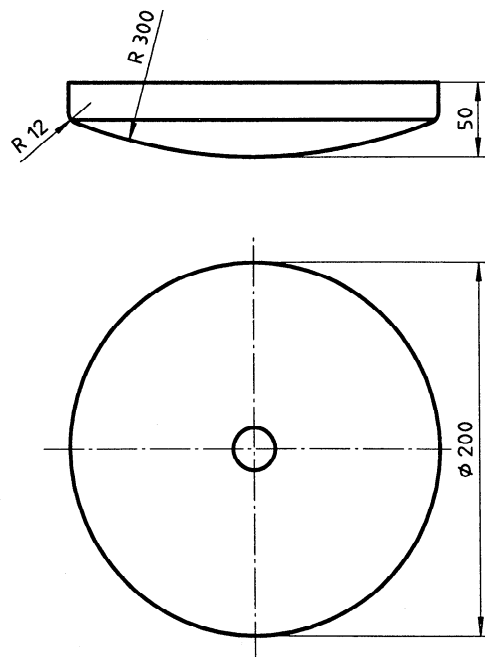


Figure 1 — Loading pad

4.5 Floor surface

This shall be horizontal and flat.

5 Testing procedures

5.1 Assembly and inspection before test

Assemble the bed in accordance with the manufacturer's instructions. Prior to the test, inspect the bed visually for defects.

5.2 Inspection of workmanship

Inspect the bed to determine whether exposed edges, screws, bolts and other fittings are rounded or chamfered and free of burrs and sharp edges.

5.3 Opening and closing

Measure the opening and closing force at a slow constant rate of movement in order to eliminate dynamic forces.

Plot the opening and closing forces throughout the arc of opening of the bed. Take the results for both opening the bed and closing it, and with the bed fitted with a mattress of the maximum and minimum mass stated in the instructions.

Calculate the opening energy from the opening arc under the appropriate part of the resultant diagram (see figure 2).

Determine the maximum load occurring on each mounting point by measurement during the procedure or by calculation from the results.

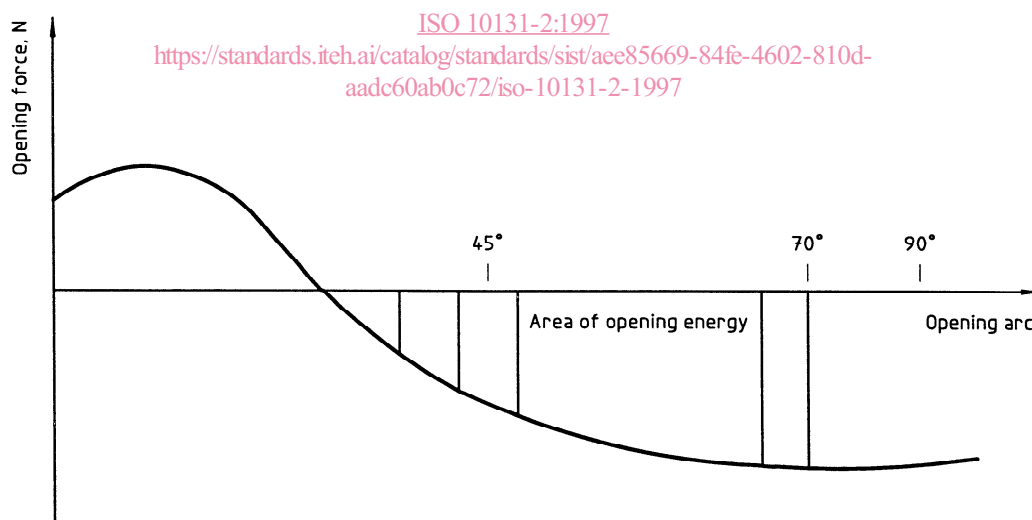


Figure 2 — Opening energy

5.4 Folding fittings

Prior to the test, pull the foldable part of the bed once down to the floor without swinging out the supporting devices.

NOTE — This does not apply to beds having supports that swing out automatically.

Determine the resisting force F_y (see figure 3) in opening or closing after 100 cycles and after 10 000 cycles.

Open and close the bed completely at a rate of three cycles (openings and closings) per minute. The apparatus for opening and closing the bed shall be constructed so as to ensure that no unspecified forces act upon the bed.

Record whether or not the fasteners used to fasten the folding fittings to the foldable part as well as to the frame have loosened or if there are any cracks.

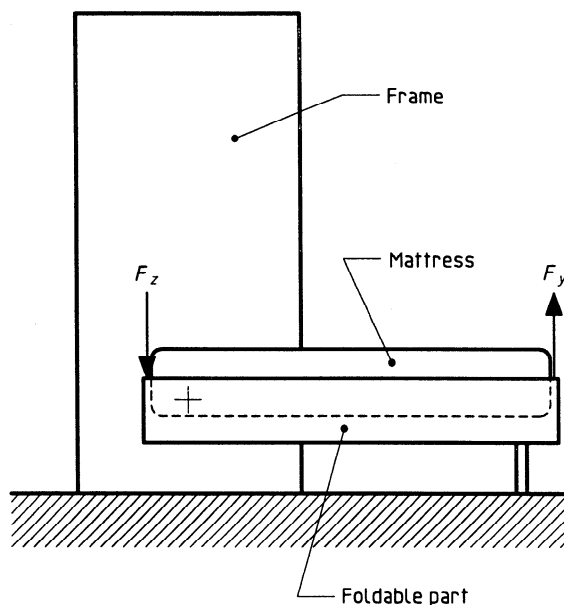


Figure 3 — Resisting force F_y
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5.5 Strength and durability

5.5.1 Strength and durability of the foldable part

Apply a vertical force of 1 000 N downwards using the loading pad shown in figure 1. Apply the load 10 000 times at each of the three positions shown in figure 4 at a rate of not more than 24 times per minute.

The loading points shall be positioned as shown in figure 4.

Dimensions in millimetres

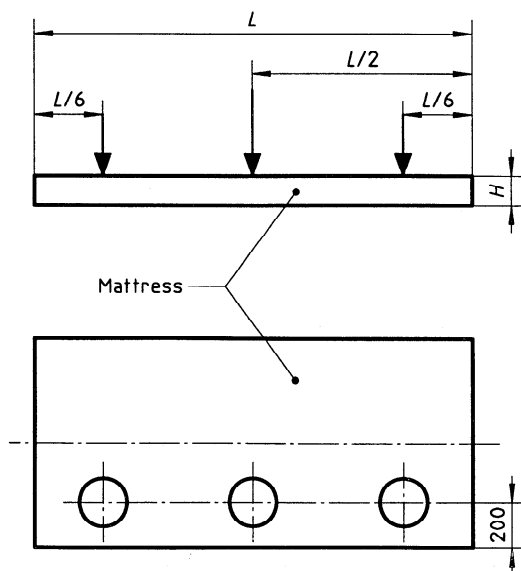
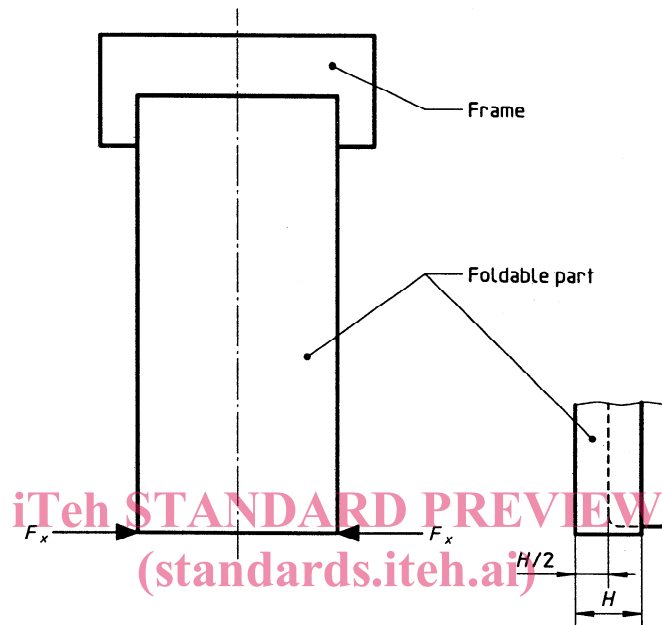


Figure 4 — Position of loadings

5.5.2 Horizontal durability test

Open the bed and ensure that the legs are able to move freely on the floor surface (4.5).

Apply an horizontal force F_x of 150 N alternately to the foot end at half-height of the right and left side of the foldable part and perpendicular to its longitudinal axis (see figure 5).



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Figure 5 — Horizontal durability test

One cycle shall last for 6 s, 1 s under load and 5 s without.

Carry out 50 cycles (5 min) at each point.

Inspect the folding mechanism and record any damage and/or loosening of fasteners.

5.5.3 Unintended closing

Install the bed in accordance with the mounting instructions and with a mattress having the minimum mass stated in the instructions for use.

For end-pivoted beds, apply a force F_z of 200 N to the edge of the structure by means of the loading pad (see 4.2).

For side-pivoted beds, apply a force F_z of 1 000 N by means of the loading pad (4.2) to the mattress, such as that the edge of the loading pad is in line with the edge of the structure.

Record whether the supports lift from the floor and, if so, by how much.

5.5.4 Unintended opening

Carry out this test 10 min after having closed the foldable part.

Apply an horizontal force F_0 to the longitudinal centre axis at a distance of 25 mm measured from the lower edge of the foldable part towards the top, this force being increased gradually up to 250 N (see figure 6).

Record the force applied and whether the bed opens or not.