भारतीय मानक
Indian Standard

IS 17635 : 2022

[*Superseding* IS 7259 (Part 1) : 1988]

बेड्स — विशिष्टि

Beds — Specification

ICS 97.140

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March 2022 **Price Group 9**

Furniture Sectional Committee, CED 35

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Furniture Sectional Committee had been approved by the Civil Engineering Division Council.

This standard was originally published in 1974 and subsequently revised in 1988 as IS 7259 (Part 1) : 1988 'Specification for wooden beds Part 1 For use with mattresses (*first revision*)'. In view of the diversification in the use different materials and finishing systems in the furniture industry, this standard has been brought out and supersedes IS 7259 (Part 1) : 1988. In this version, the requirements related to the performance and safety of beds for adult for domestic and non-domestic use have been specified. This standard applies to completely manufactured/fabricated beds. It also applies to ready-to-assemble units; in that case the requirements of this standard shall apply to the assembled units.

This standard does not cover waterbeds, airbeds, foldaway beds, bunk beds and beds for people with special needs, nor the beds for healthcare and medical purposes.

Test methods for the assessment of ageing, degradation, fire resistance and electrical functions are not included in this standard. Other features associated with beds including electrical adjustability or conversion from a sofa to a bed are not covered in this standard. The figures given in this standard are typical and the test procedures shall be followed.

In the formulation of this standard, considerable assistance has been taken from ISO 19833 : 2018 'Furniture — Beds — Test methods for the determination of stability, strength and durability'.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated, expressing the result of a test or analysis shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

BEDS — SPECIFICATION

1 SCOPE

1.1 This standard covers the requirements related to the performance and safety of beds for adults for domestic and non-domestic use.

1.2 This standard applies to completely manufactured/fabricated beds. It also applies to ready-to-assemble units; in that case the requirements of this standard shall apply to the assembled units.

1.3 This standard does not cover waterbeds, airbeds, foldaway beds, bunk beds and beds for people with special needs, nor the beds for healthcare and medical purposes.

2 REFERENCES

The following Indian standards contain provisions which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in below:

IS No.	*Title*
5533 : 1969	Recommendation for dimensions of spaces for human activities
7888 : 1976	Methods of test for flexible polyurethane foam
17637 : 2021	Performance requirements of surface finishes for furniture applications

3 TERMINOLOGY

For the purposes of this part of standard, the following definitions shall apply.

3.1 Bed Base — The part of the bed that supports the mattress and is supported by the bed frame.

3.1.1 *Unframed Slat Base* — Bed base consisting of separate slats flexibly held together normally by means of textile, rubber or plastic tape.

NOTE — When loading one slat, the load is transferred to the support by that slat only.

3.1.2 *Framed Base* — Bed base consisting of slats etc, which are connected to a structural frame system.

NOTE — When loading one component only, for example, a slat, the load is distributed by the frame to the support.

3.2 Bed Frame — The part of the bed that rests on floor and supports the bed base.

3.3 Durability Tests — Tests simulating the repeated movement of components occurring during long-term use and assessing the strength of the furniture under such conditions.

3.4 Surface Finish Tests — Tests for surfaces of finished furniture to assess the resistance against given external conditions.

3.5 Stability Tests — Tests for the ability to withstand load in all normal use conditions without the product toppling or creating unsafe use case like injury to user or inability to perform task the product is meant for.

3.6 Strength Tests — Tests for the capacity of the product to withstand force or pressure as specified in the standard considering the extreme use conditions for a limited frequency of use.

3.6.1 *Static Tests* — Tests 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.

3.6.2 *Impact Tests* — Tests to assess the strength of the furniture under the rapid rates of loading that occasionally occur.

4 DESIGN AND WORKMANSHIP

4.1 Design/model shall be as declared by the manufacturer.

4.2 The exposed/accessible edges and protruding parts shall be free from burrs, sharp edges and shall be rounded or chamfered. The ends of accessible hollow components shall be closed or capped. Movable and adjustable parts shall be designed so that injuries and inadvertent operations are avoided. In the case of wooden components, the same shall be free from any stain, unless it is intended as part of design feature.

5 DIMENSIONS

The minimum dimensions of spaces for human activities of the assembled bed shall be as per IS 5533.

NOTE — Any other dimensions as agreed to between the manufacturer and the purchaser or as per the design requirements may also be used.

6 SURFACE PERFORMANCE

6.1 The test sample rigid surfaces shall be tested for the following tests and shall qualify the minimum performance ratings specified in IS 17637.

a) Resistance to mechanical damage;
b) Pencil hardness;
c) Resistance to wet heat;
d) Resistance to dry heat;
e) Resistance to marking by cold liquids;
f) Resistance to marking by cold oils and fats; and
g) Adhesive performance.

The test samples for surface performance are to be tested on materials only and not on assembled unit.

6.2 Fabric and Leather (Synthetic and Natural) Performance

For fabric and/or leather (synthetic and natural) surfaces, the test sample surfaces shall be tested for the following tests and shall conform the minimum performance requirements specified in IS 17637.

a) *For Fabric and Synthetic Leather*:
   1) Breaking load,
   2) Elongation at break,
   3) Tear strength,
   4) Colour fastness to light,
   5) Colour fastness to rubbing,
   6) Colour fastness to perspiration,
   7) Colour fastness to water,
   8) Pilling resistance,
   9) Coating adhesion strength,
   10) Seam slippage,
   11) Resistance to damage by flexing,
   12) Abrasion resistance,
   13) Bursting strength, and
   14) Resistance to cold.
b) *For Natural Leather:*
   1) Tear strength,
   2) Flexing endurance,
   3) Finish adhesion,
   4) Colour fastness to artificial light,
   5) Colour fastness to rubbing,
   6) Colour fastness to water spotting,
   7) Water vapour permeability, and
   8) Colour fastness to water.

The test samples for surface performance are to be tested on materials only and not on assembled unit.

7 SAFETY TESTS

7.1 The general test conditions and test apparatus requirements for the safety tests are given in Annex A and Annex B respectively**.**

7.2 When the mattress, bed base and frame (if applicable) are supplied together as a bed set, they shall be tested together.

When other components are supplied separately, they shall be tested using the test mattress, test support or test bed base described in Annex B.

Table 1 shows which tests are applicable to a complete bed and which to parts of a bed. The forces given in Table 2 to Table 4 and in other tests are considered to be suitable for beds for a maximum single user weight of 110 kg.

7.3 Stability Test

Position the bed on the floor surface (*see* **B-2**) with the legs or base restrained by stops (*see* **B-3**) (*see* Fig. 1A) and Fig. 1B).

Apply two downward forces F_1 and F_2 simultaneously by means of the small loading pad (*see* **B-5**) at point A and point B, 60 mm behind the front edge of the bed sides. At each loaded position, apply two outward forces F_3 and F_4 simultaneously for at least 5 s along a horizontal line extended forward from the point where the base of the loading pad meets the upper surface of the bed side/bed frame. The forces shall be as Table 2. *See* Fig. 1A) and Fig. 2. If the construction of the bed is symmetrical in width direction, perform the test at one side only. The forces shall be as per Table 2.

Table 1 Testing of Beds, Bed Frames and Bed Bases

(*Clause* 7.2)

Test	7.3	7.4.1	7.4.2	7.5	7.6.1	7.6.2	7.6.3	7.7
Complete bed	√	√	√	√	√	√	√	√
Bed base	(√)	√	(√)	(√)	√	(√)	(√)	√
Bed frame	√	√	√	√	(√)	√	(√)	(√)

(√) = if applicable
√ = test to be carried out

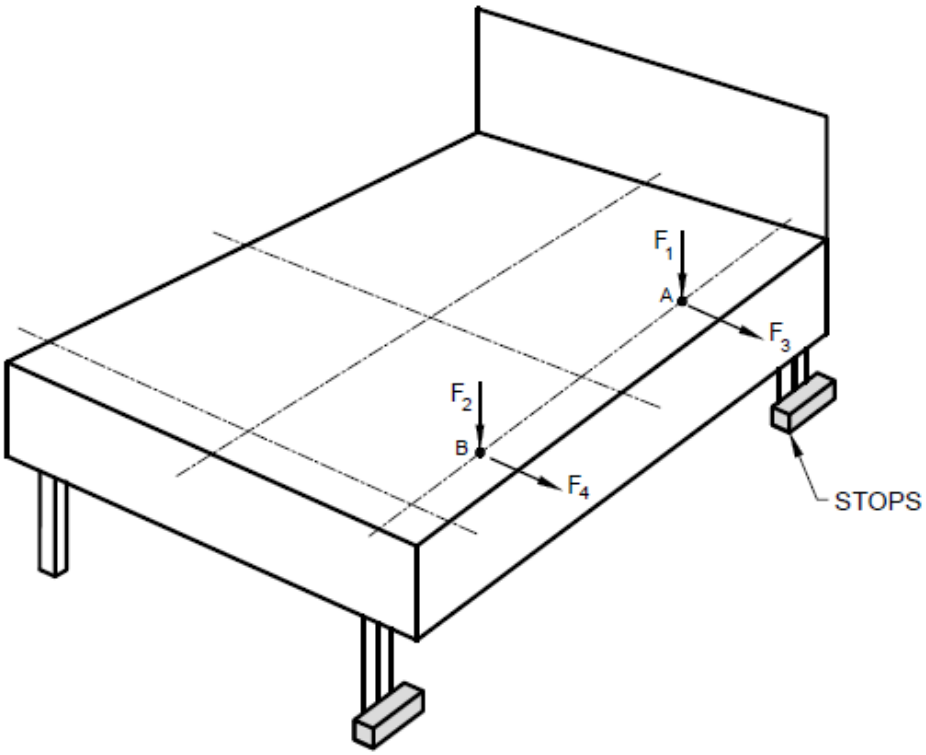


FIG. 1A

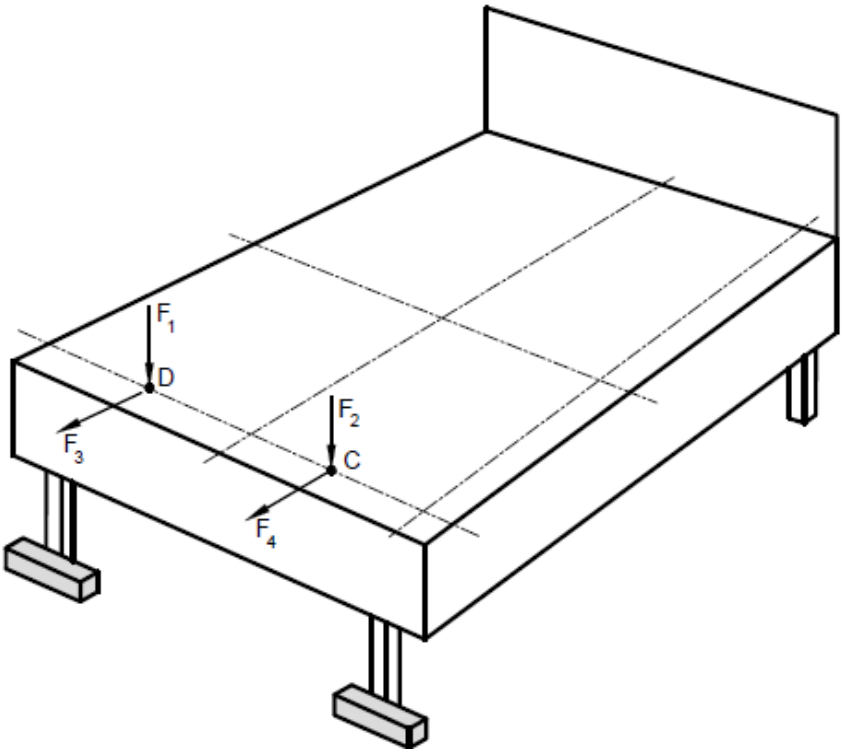
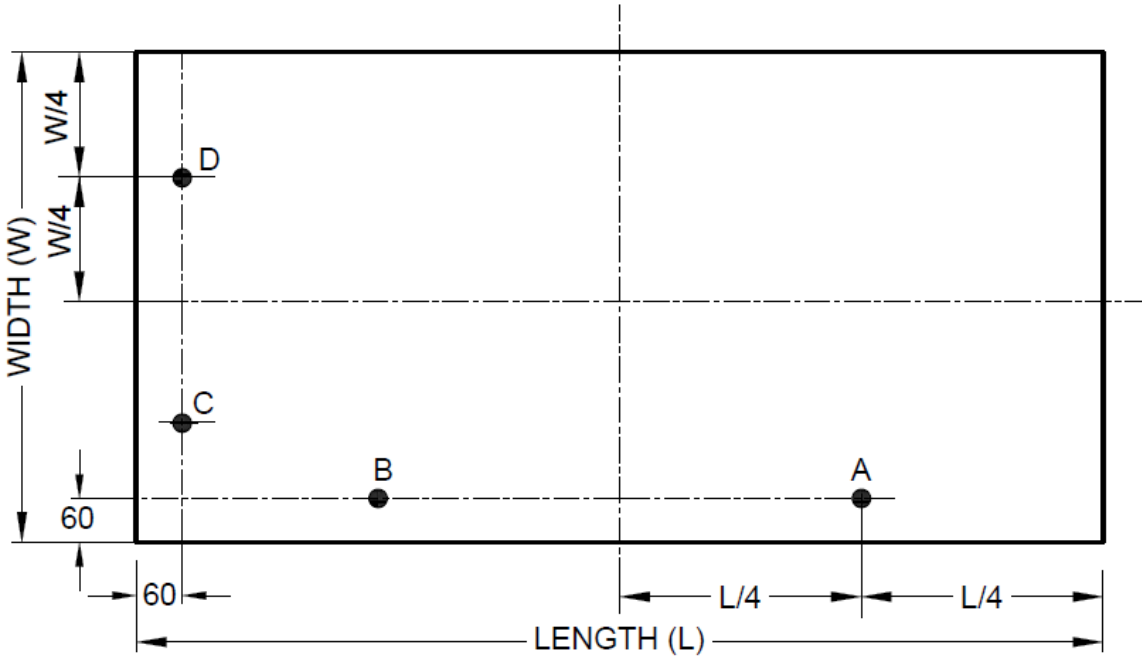


FIG 1B

All dimensions in millimetres

FIG. 1 STABILITY TEST



All dimensions in millimetres

FIG. 2 VERTICAL LOADING POINTS OF STABILITY

If the headboard and footboard are of the same construction, perform the test at the side containing the footboard. *See* Fig. 1B and Fig. 2. Repeat the same test at one end of the bed.

Position A and B are 1/4 length of bed base. Position C and D are 1/4 width of bed base (*see* Fig. 2). If the construction of the bed is not symmetrical with the weight not evenly distributed or the legs not positioned symmetrically, perform the test in the most adverse position. Record and assess defects in accordance with **9.4**.

Table 2 Stability Test Forces

(*Clauses* 7.2 *and* 7.3)

Sl No.	Test	Force	
(1)	(2)	(3)	(4)
i)	Stability test	F_1	600 N
		F_2	600 N
		F_3	20 N
		F_4	20 N

7.4 Vertical Static Load Tests

7.4.1 *Vertical Static Load on Bed Base*

Apply the vertical force (F) downwards using the loading pad (*see* **B-4**), at all points of the bed base where failure is likely to occur, but not less than 100 mm from any edge. If there are several such positions, carry out the test at a maximum of 4 different positions. The force and the number of cycles shall be as specified in Table 3. Record and assess defects in accordance with **9.4**.

7.4.2 *Vertical Static Load on Side Rail*

Using two small loading pads (*see* **B-5**), apply two vertical downward forces F_1 and F_2 simultaneously for 1 min on the centre line of the top surface of one side rail. The loading points shall be 300 mm either side of the middle point line of the side rail, as shown in Fig. 3. The bed shall be loaded sufficiently to prevent it from overturning. If the materials/constructions are not identical, repeat the test on the other side rail. The force and the number of cycles shall be as specified in Table 3. Record and assess defects in accordance with **9.4**.

7.5 Horizontal Static Load Tests

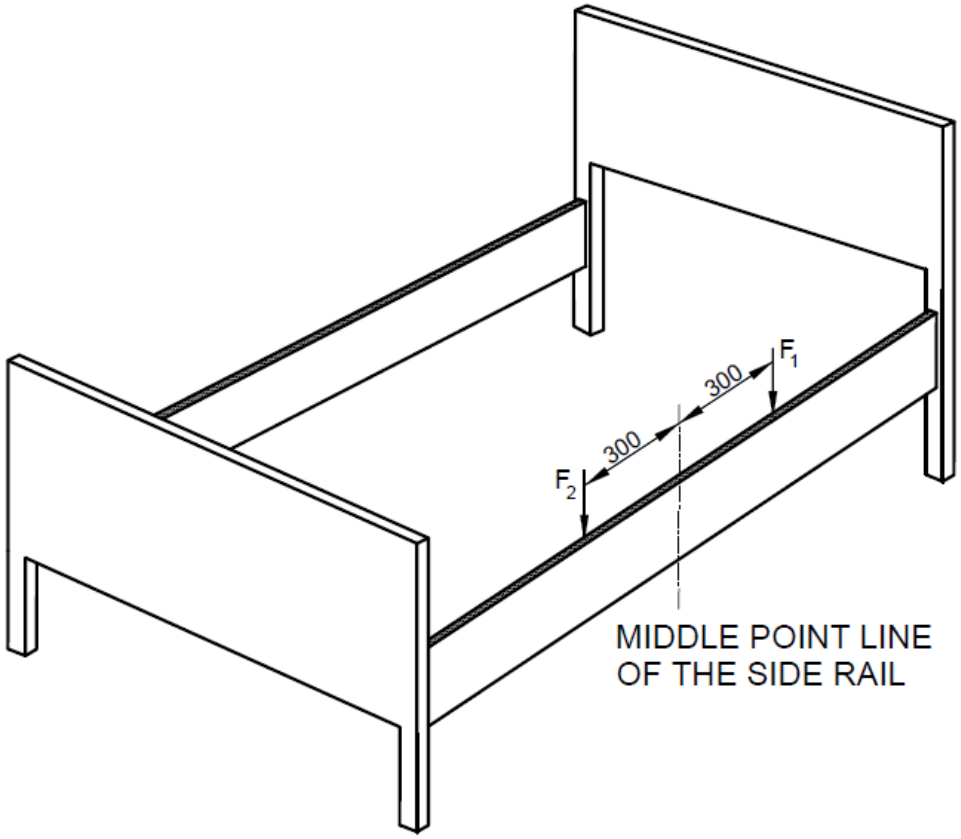
7.5.1 *Horizontal Static Load on Headboard*

This test only applies to beds with headboards or equivalent structures which are designed to be leant against by users. This test is not applicable to beds without headboards or whose headboard's upper edge is less than 300 mm high from the upper surface of the bed base.

Table 3 Strength Tests — Loads, Forces and Cycles

(*Clauses* 7.2, 7.4.1, 7.4.2, 7.5.1.1, 7.5.1.2 *and* 7.5.2)

Sl No.	Tests	Force/Mass		Cycles
(1)	(2)	(3)	(4)	(5)
i)	Vertical static load on bed base	F	2 000 N	10
ii)	Vertical static load on side rail	F_1	1 200 N	10
		F_2	1 200 N	
iii)	Horizontal static load on headboard of beds ≤ 1 200 mm in width	Mass	100 kg	10
		F	400 N	
iv)	Horizontal static load on headboard of beds > 1 200 mm in width	Mass	100 kg	10
		F	400 N	
v)	Horizontal static load test of beds without headboard	F	400 N	10



All dimensions in millimetres

FIG. 3 VERTICAL STATIC LOAD ON SIDE RAILS

7.5.1.1 *For beds ≤ 1 200 mm in width*

Place the stops (*see* **B-3**) behind the legs/base to prevent the bed from moving during the test. Apply the mass on the centre line of the bed base, 175 mm from the headboard. Apply the outward force (*F*) using the loading pad (*see* **B-4**). The loading point shall be at 600 mm above the upper surface of the bed base or at a point 100 mm below the upper edge of the headboard, whichever is the lower. The loading point shall be at the centre line of the headboard (*see* Fig. 4).

The mass, the force and the number of cycles to be used to carry out the test shall be as specified in Table 3. Record and assess defects in accordance with **9.4**.

7.5.1.2 *For beds > 1 200 mm in width*

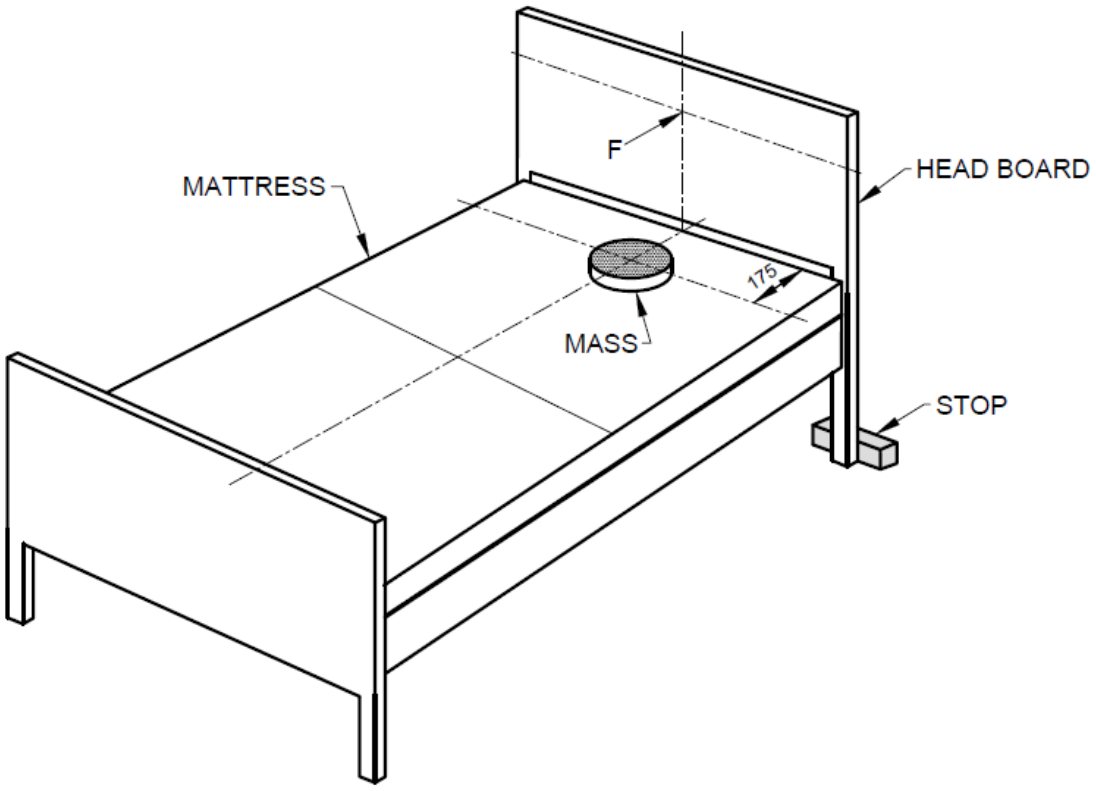
Place the stops (*see* **B-3**) behind the legs/base to prevent the bed from moving during the test. Apply two masses simultaneously at points on a line 175 mm from the headboard, 300 mm on either side of the centre line of the bed base. Apply two horizontal outward forces (*F*) simultaneously using the loading pad (*see* **B-4**). The loading points shall be at 600 mm above the upper surface of the bed base or at a point 100 mm below the upper edge of the headboard, whichever is the lower (*see* Fig. 5). The loading points shall be 300 mm on either side of the centre line of the headboard (*see* Fig. 5).

The mass, the force and the number of cycles to be used to carry out the test shall be as specified in Table 3. Record and assess defects in accordance with **9.4**.

7.5.2 *Horizontal Static Load Test of Beds Without Headboard*

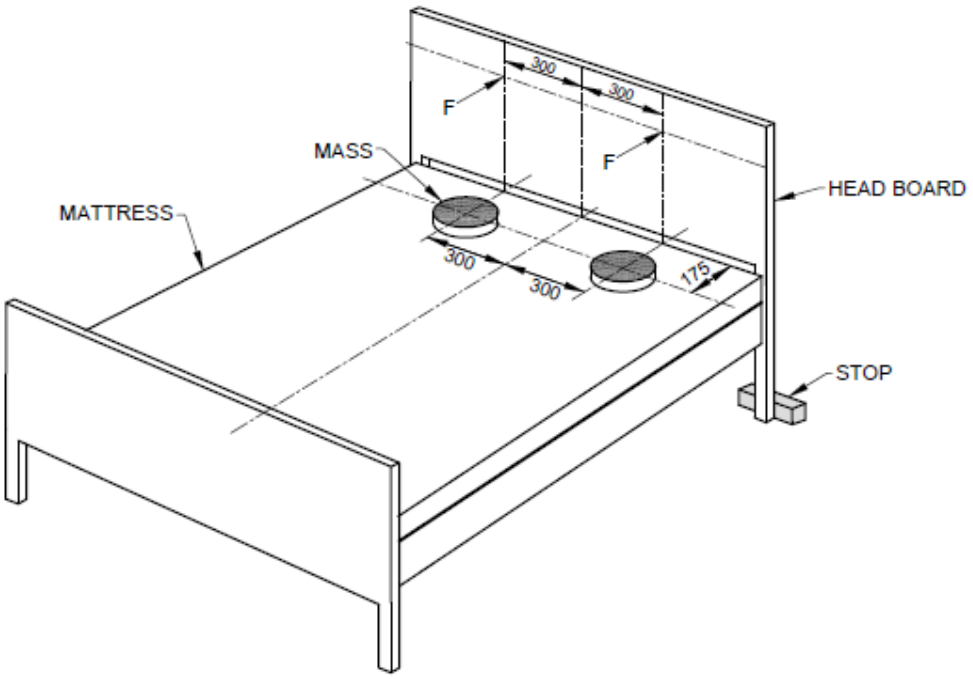
Place the stops (*see* **B-3**) behind the legs/base to prevent the bed from moving during the test and the test mass (*see* **B-12**) at the approximate centre of the bed base.

Apply the horizontal force (*F*) using the loading pad (*see* **B-4**). The loading point shall be at the centre line of the end member, 50 mm below the upper edge of the end member which is furthest away from the stops (*see* Fig. 6). The force and the number of cycles shall be as specified in Table 3. Record and assess defects in accordance with **9.4**.



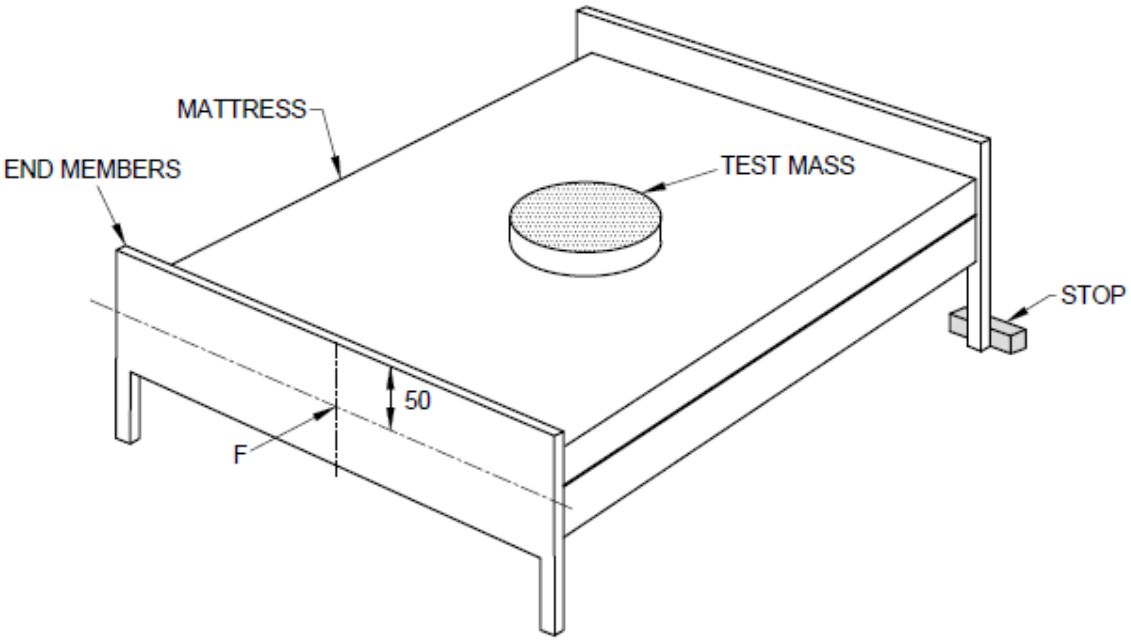
All dimensions in millimetres

FIG. 4 HORIZONTAL STATIC LOAD ON HEADBOARD OF BEDS ≤ 1 200 mm IN WIDTH



All dimensions in millimetres

FIG. 5 HORIZONTAL STATIC LOAD ON HEADBOARD OF BEDS > 1 200 mm IN WIDTH



All dimensions in millimetres

FIG. 6 HORIZONTAL STATIC LOAD TEST FOR BEDS WITHOUT HEADBOARD

7.6 Durability Tests

7.6.1 *Vertical Durability Test of Bed Base*

Apply the vertical downward force (*F*) by using the loading pad (*see* **B-4**) at each position as follows (*see* Fig. 7):

a) Centre of the bed base (point A);

b) Point 300 mm from the adjacent edges (point B);

c) Point opposite of B (point C); and

d) Point on the transverse centreline, 200 mm from the long edge (point D).

For beds > 1 200 mm in width, position the test mass (*see* **B-12**) at the geometric centre of the unloaded half part of the bed base (s*ee* Fig. 7). And for beds ≤ 1 200 mm in width, apply the vertical downward force (*F*) without positioning the test mass. If the bed tends to overturn, load the bed base gradually to prevent overturning.

The force and the number of cycles shall be as per Table 4. In the case where the supporting structure of head and feet is identical, the test shall be performed in the middle and to one end only. Record and assess defects in accordance with **9.4**.

7.6.2 *Horizontal Durability Test of Bed Frame*

When the bed is supplied with a mattress, the mattress shall be placed on the bed base as specified by the manufacturer. If the bed is supplied without a mattress, position the mass at the centre of the bed base. Place stops around the legs or base at one end. If there is a headboard, place the stops at that end (*see* Fig. 8 and Fig. 9).

Apply two horizontal forces F_1 and F_2 alternately by means of the small loading pad (*see* **B-5**) at the unrestrained bed end and perpendicular to the longitudinal axis of the side rail. *See* Fig. 8 and Fig. 9. The loading points shall be at the height of the upper surface of the bed base, 100 mm inboard from the outside plane of the end member (*see* Fig. 9).

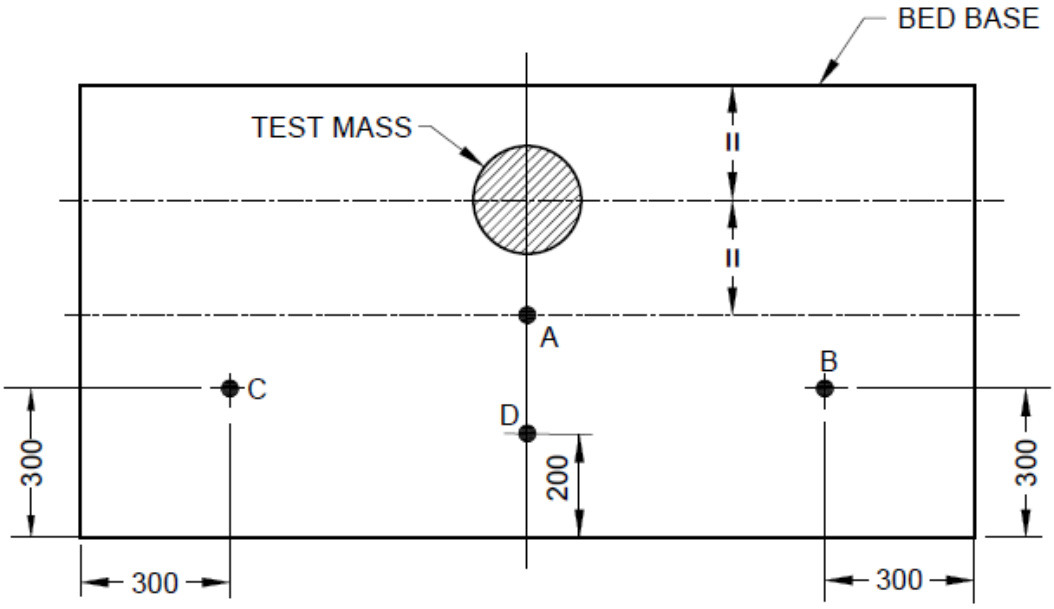
One application of the force in each direction represents one cycle. The mass, the forces and the number of cycles to be used to carry out the test shall be as per Table 4. The cycle rate shall not exceed 5 cycles per minute. Record and assess defects in accordance with **9.4**.

7.6.3 *Horizontal Durability Test of Headboards*

This test only applies to beds with headboards, foot boards or equivalent structures which are designed to be leant against by users. And not applicable to beds without headboards or whose headboard's upper edge is less than 300 mm high from the upper surface of the bed base.

7.6.3.1 *For beds ≤ 1 200 mm in width*

Place the stops (*see* **B-3**) behind the legs/base to prevent the bed from moving during the test. Apply the mass on the centre line of the bed base, 175 mm from the headboard. Apply the outward force (*F*) using the loading pad (*see* **B-4**). The loading point shall be at 600 mm above the upper surface of the bed base or at a point 100 mm below the upper edge of the headboard, whichever is the lower. The loading point shall be at the centre line of the headboard (*see* Fig. 10).



All dimensions in millimetres

FIG. 7 VERTICAL DURABILITY TEST OF BED BASE

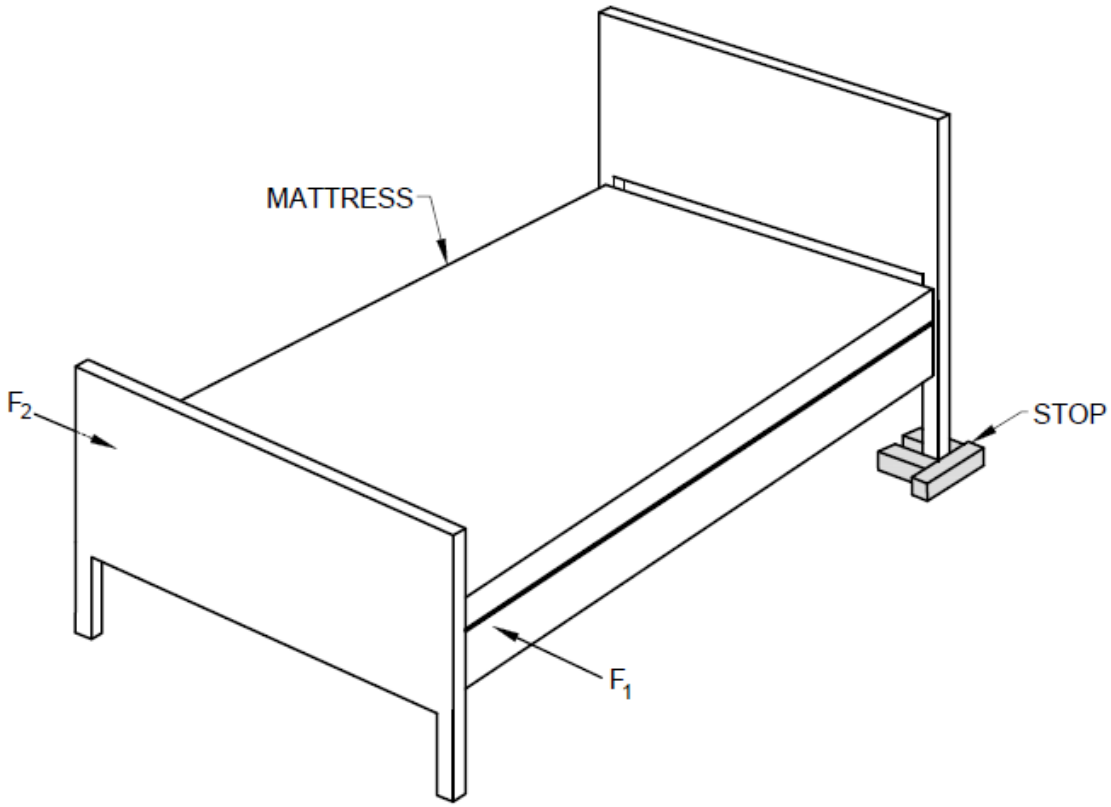


FIG. 8 HORIZONTAL DURABILITY TEST OF BED FRAME

The mass, the force and the number of cycles to be used to carry out the test shall be as per Table 4. The cycle rate shall not exceed 5 cycles per minute. Record and assess defects in accordance with **9.4**.

7.6.3.2 *For beds > 1 200 mm in width*

Place the stops (*see* **B-3**) behind the legs/base to prevent the bed from moving during the test. Apply two masses simultaneously at points on a line 175 mm from the headboard, 300 mm on either side of the centre line of the bed base.

Apply two horizontal outward forces (F) simultaneously using the loading pad (*see* **B-4**). The loading points shall be at 600 mm above the upper surface of the bed base or at a point 100 mm below the upper edge of the headboard, whichever is the lower (*see* Fig. 11). The loading points shall be 300 mm on either side of the centre line of the headboard (*see* Fig. 11).

The masses, the forces and the number of cycles to be used to carry out the test shall be as per Table 4. The cycle rate shall not exceed 5 cycles per minute. Record and assess defects in accordance with **9.4**.

Table 4 Durability Tests – Loads, Forces and Cycles

(*Clauses* 7.2, 7.6.1, 7.6.2, 7.6.3.1 *and* 7.6.3.2)

Sl No.	Tests	Force/Mass		Cycles
(1)	(2)	(3)	(4)	(5)
i)	Vertical durability test of bed base	F	1 200 N	10 000
ii)	Horizontal durability test of bed frame	Mass	50 kg	10 000
		F_1	150 N	
		F_2	150 N	
iii)	Horizontal durability test of headboard of beds ≤ 1 200 mm in width	Mass	100 kg	20 000
		F	150 N	
iv)	Horizontal durability test of headboard of beds > 1 200 mm in width	Mass	100 kg	20 000
		F	150 N	

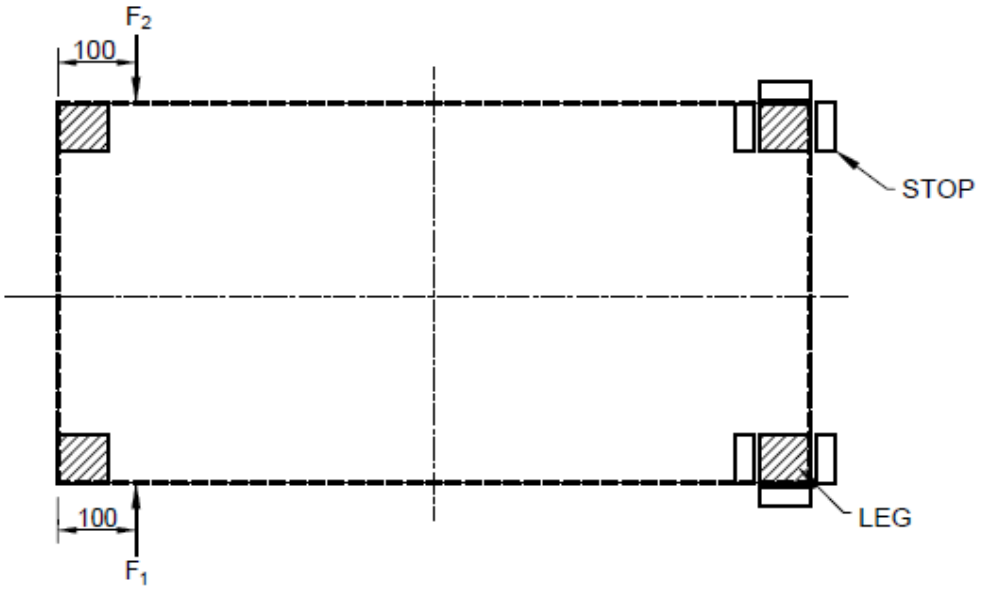


FIG 9A BED WITH FEET

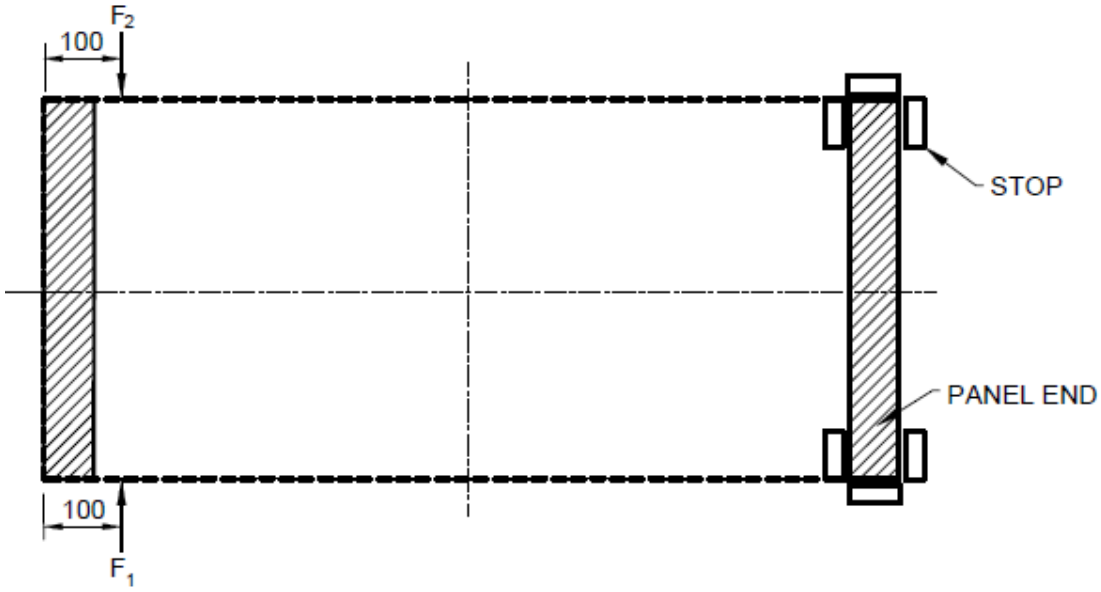
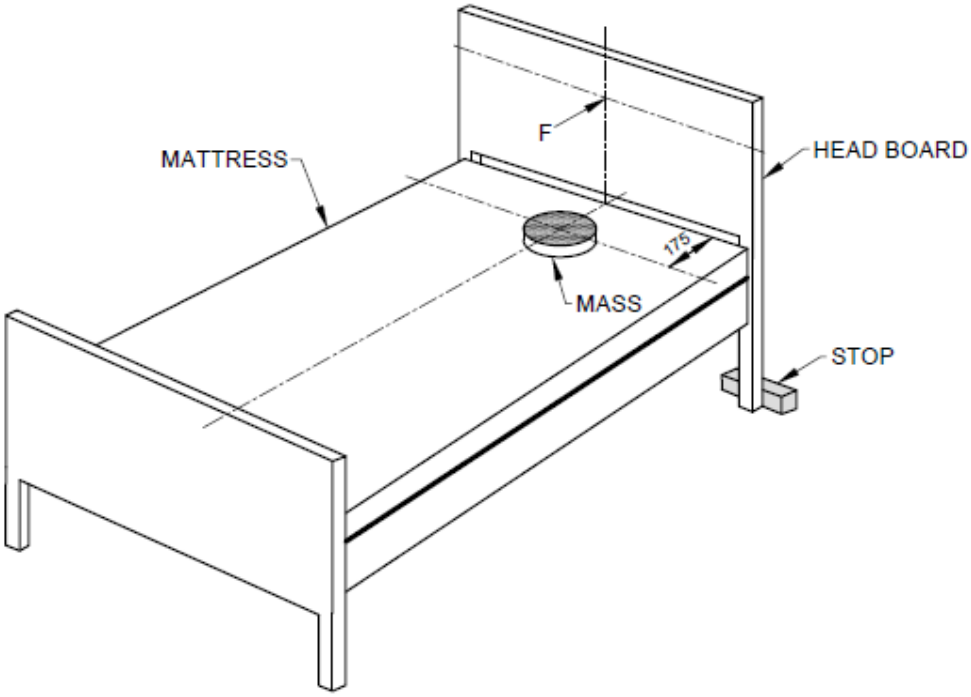


FIG 9B BED WITH PANEL ENDS

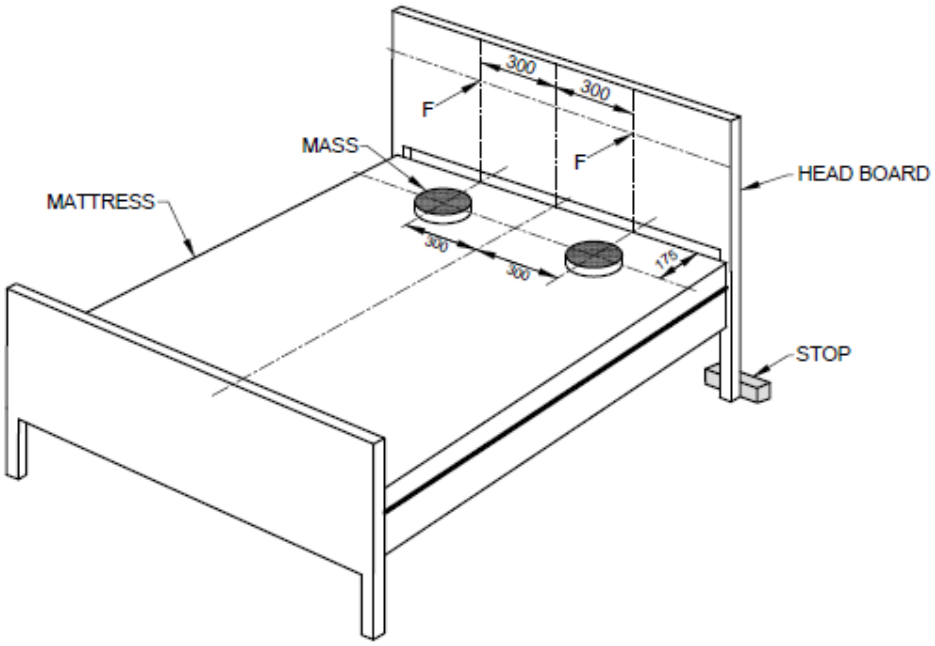
All dimensions in millimetres

FIG. 9 HORIZONTAL DURABILITY TEST OF BED FRAME – FORCE APPLICATION POINTS AND DIRECTIONS



All dimensions in millimetres

FIG. 10 HORIZONTAL DURABILITY OF HEADBOARDS OF BEDS ≤ 1 200 mm IN WIDTH



All dimensions in millimetres

FIG. 11 HORIZONTAL DURABILITY OF HEADBOARDS OF BEDS > 1 200 mm IN WIDTH

7.7 Vertical Impact Test

The impactor (*see* **B-7**) shall be lifted to the height of 240 mm (measured from the top face of the unloaded mattress) and then drop freely onto the mattress (*see* **B-6**), at the following positions (*see* Fig. 12):

a) centre of the bed base (point A);
b) one third of the longitudinal axis from the middle (point B);
c) point opposite of B (point C);
d) point 250 mm from the adjacent inside edges (point D on each side); and
e) one other point of the bed base where failure is most likely to occur (the location of the point shall be recorded in the test report).

Drop the impactor at each of the selected positions of impact (*see* Fig. 12) for 20 number of cycles. The impactor shall be permitted to fall freely but may be guided by a guide rail. Record and assess defects in accordance with **9.4**.

8 DURABILITY OF STORAGE ELEMENTS IN BEDS

8.1 Mechanisms for Lifting Bed Bases

8.1.1 *General*

This test is only applicable to bed bases that are designed to be lifted by the user through a mechanism (for example, hydraulic lift, hand lift, etc).

If a test cannot be carried out as specified in the standard, for example, a force cannot be applied at the specified position due to the design of a product, the test shall be carried out as closely as possible to specified in the standard, and any deviations shall be recorded in the test report.

8.1.2 *Durability of Mechanisms for Lifting Bed Bases*

For beds supplied with a mattress, place a mass m_1 (5 kg) at the approximate centre of the mattress. And for beds supplied without a mattress, place a mass m_2 (55 kg) at the approximate centre of the bed base.

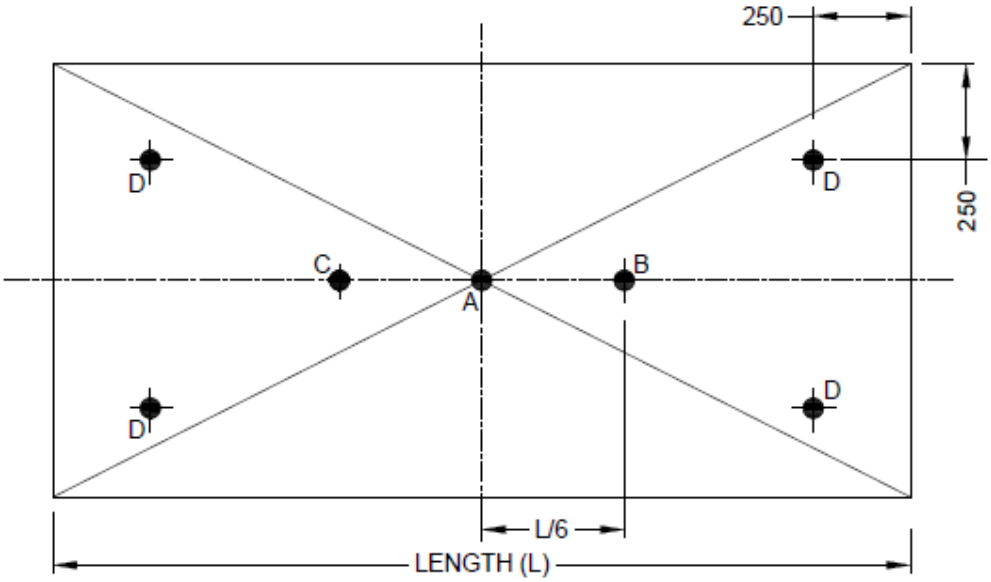
NOTE — In case the bed base lifting mechanism is partial opening type, the mass m_2 should be calculated as m_2 = (Area of the opening part/Total area of the bed base) × 55 kg.

Lift and close the bed base at a rate of maximum 3 cycles per minute. One cycle shall comprise movement from the lowest position to the maximum lifted position and back again without applying any force to latching and/or activating mechanisms (*see* Fig. 13). Total number cycles shall be 5 000. The test device shall apply only those forces necessary to achieve the required motion and shall not add forces to the bed base. The latching and/or activating mechanisms may be cycled concurrently or independently for the complete test. Record and assess defects in accordance with **9.4**.

8.2 Extendable Storage Elements

8.2.1 *General*

This test is only applicable to bed bases that are designed with storage elements under the bed base that



All dimensions in millimetres

FIG. 12 IMPACT POSITIONS

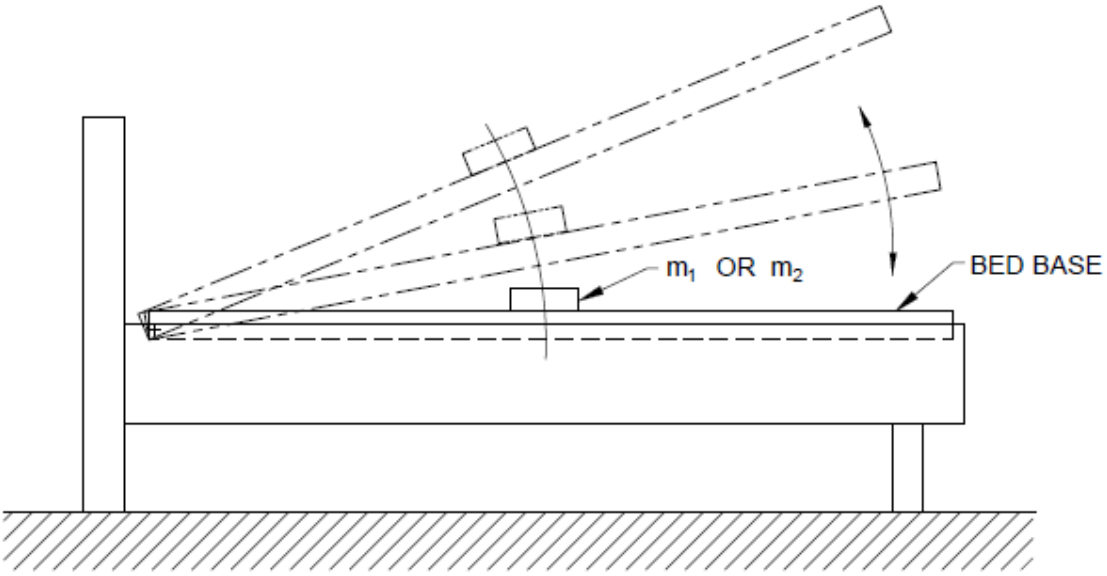


FIG. 13 LIFTING AND CLOSING OF BED BASE

are extendable for access, for example, drawer on slide or on castors. The test device shall apply only those forces necessary to achieve the required motion and shall not add forces to the bed base.

8.2.2 *Durability of Extendable Storage Elements*

Load the extension element shall be 350 kg/m^3 (*See* Fig. 14). Without impacting the stops, or providing vertical support, open and close the extension element gently for 5 000 number of cycles. Extension elements that do not have open stops shall be opened to a point at which one-third of the inside length (depth) of the extension element, at least remains inside the unit and greater than equal to 100 mm, whichever is higher (*see* Fig. 15). Record and assess defects in accordance with **9.4**.

If the extension element has a catch device at any position, that shall be allowed to operate at each cycle. The force shall be applied via the handle or, in case of two handles, in the middle between the handles. On extension elements without a handle, apply the force at the same level as the runners.

The extension element shall be opened/closed gently at a rate of 6 to 15 cycles per minute. The recommended average speed is (0.25 + 0.1) m/s.

9 SAMPLING AND CRITERIA OF CONFORMITY

9.1 All beds of same model/design and manufactured from same raw materials offered for inspection shall constitute a lot.

9.2 The required number of bunk beds shall be selected at random and depend upon the size of the lot.

9.3 The sample selected as per **9.2** shall be subjected to the tests as per **6, 7** and **8** as applicable. The lot shall be declared as conforming to the requirements of this standard, if the sample meets the requirements of all the tests mentioned therein.

9.4 The criteria of the conformity for the tests as per **6** shall be same as specified therein. However, for the tests as per **7** and **8** the criteria of conformity shall be as follows:

a) The bed does not overturn during and after stability test;

b) There are no fractures of any member, joint or component;

c) There is no loosening of joints intended to be rigid;

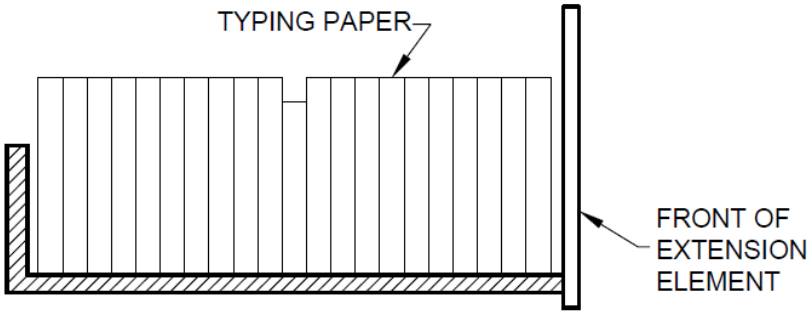


FIG 14A SIDE VIEW

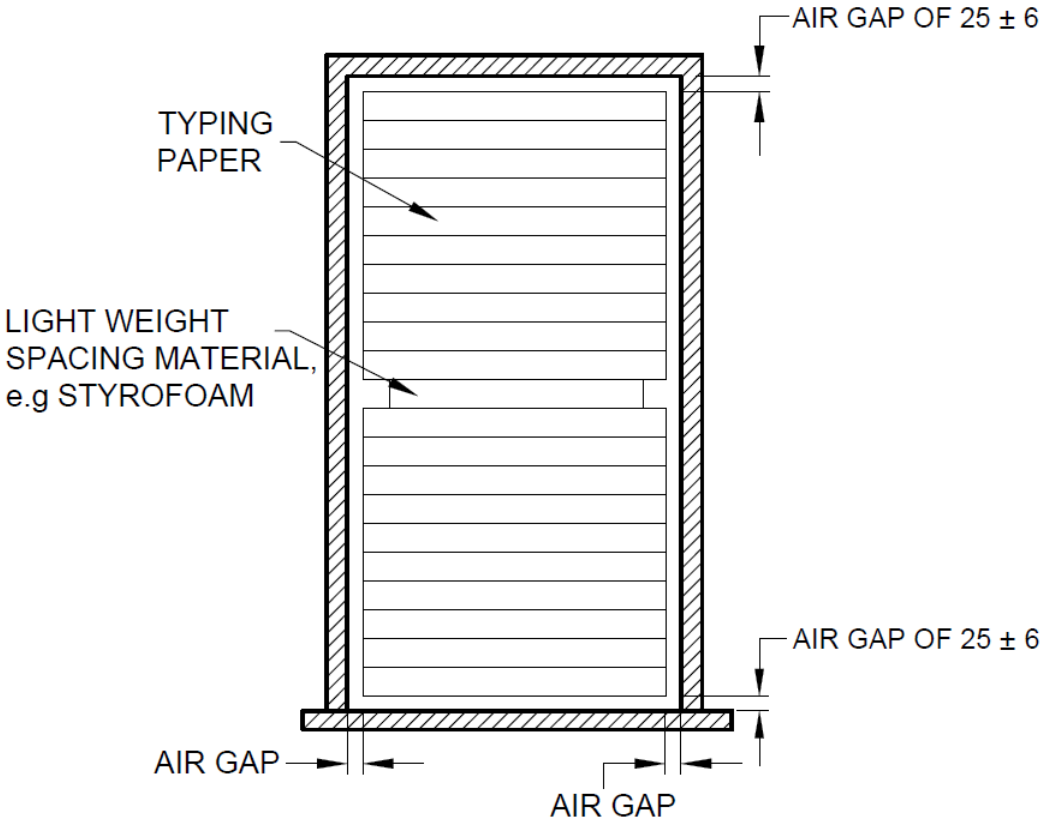
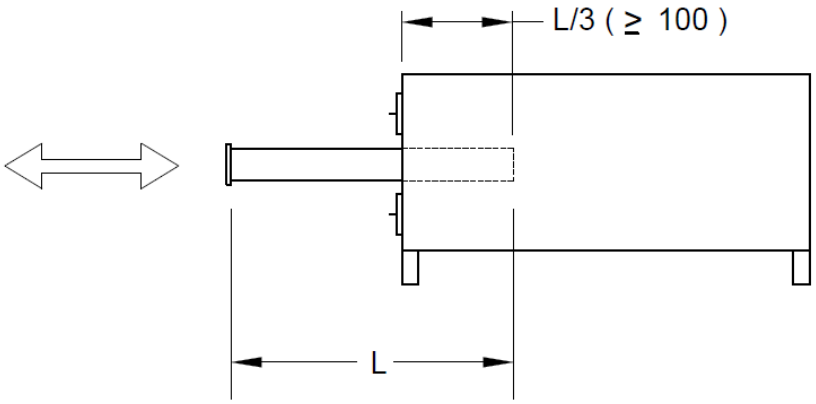


FIG 14B TOP VIEW

All dimensions in millimetres

FIG. 14 AN ILLUSTRATION OF LOADING OF SUSPENDED FILLING POCKETS WITH TYPING PAPER EXTENSION ELEMENTS



All dimensions in millimetres

FIG. 15 DURABILITY OF EXTENDABLE STORAGE ELEMENTS

d) No deformation or wear of any part or component such that its functioning is impaired and/or if the element is visible in use condition, the deformation shall be ≤ 5 mm/metre length of the element; and

e) The bed fulfils its functions after removal of the test loads.

10 MARKING

10.1 Each bed shall be indelibly and legibly marked with the following particulars:

a) Manufacturer's name, brand name or his recognized trade mark, if any;

b) Date of manufacture;

c) Designed for number of users (as declared by the manufacturer);

d) Design/Model Number (as declared by the manufacturer); and

e) Batch number.

10.2 Each bed meant to be assembled by the customer shall have the instruction for assembly provided as a leaflet and/or available in digital document file.

10.3 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product(s) may be marked with the Standard Mark.

ANNEX A

(*Clause* 7.1)

GENERAL TEST CONDITIONS

A-1 PRELIMINARY PREPARATION

The tests are designed to be applied to a bed that is fully assembled and ready for use. The furniture unit shall be tested as delivered or it shall be assembled according to the instructions supplied with it. If the furniture can be assembled or combined in different ways, the most adverse configuration intended for use shall be used for each test. If mounting or assembly instructions are not supplied, the assembly method shall be recorded in the test report. Fittings shall be tightened before testing and shall not be retightened unless specifically required by the manufacturer.

All the safety tests shall be carried out on the same sample. The tests shall be carried out in indoor ambient conditions in the range of 15 °C to 35 °C. For furniture products including hygroscopic materials it needs to be to conditioned to ambient environment's relative humidity prior to testing.

Levelling devices shall be opened to their midpoint of adjustment, but not more than 10 mm. During testing, the unit shall be placed on the floor and levelled, unless otherwise specified.

Before beginning the testing, visually inspect the unit thoroughly. Record any defects so that they are not assumed to have been caused by the tests.

A-2 APPLICATION OF FORCES

The test forces in the static load tests shall be applied slowly enough to ensure that negligible dynamic force is applied. Unless otherwise indicated, each force shall be maintained for (10 ± 2) s.

The test forces in durability tests shall be applied at a rate such that excessive heating does not occur. Unless otherwise specified, each test force shall be maintained for (2 ± 1) s.

The forces may be replaced by masses. The relationship 10 N = 1 kg shall be used.

A-3 TOLERANCES

The following tolerances are applicable:

a) Forces : ± 5 percent of the nominal force;

b) Masses : ± 1 percent of the nominal mass;

c) Dimensions : ± 5 mm of the nominal dimension on soft surfaces and ± 2 mm of the nominal dimension on all other surfaces; and

d) Angles : ± 2° of the nominal angle.

The accuracy for the position of loading pads and impactor shall be ± 5 mm.

A-4 SEQUENCE OF TESTING

All applicable tests as mentioned in **7** shall be carried out on the same sample and in the sequence as the clauses are numbered in this standard. However, the durability of storage elements shall be tested on the same sample before the safety tests.

A-5 LOADING

All storage components supplied with beds, which are not subject to testing, shall be uniformly loaded with the load(s) of 350 kg/m^3.

NOTE — The volume of storage components/exetension elements is calculated from the internal depth × internal width × internal clear height.

ANNEX B

(*Clauses* 7.1, 7.3, 7.4, 7.5, 7.6 *and* 7.7)

TEST APPARATUS

B-1 GENERAL

The equipment shall not inhibit deformation nor cause unnatural deformation of the unit/component, that is, it shall be able to move so that it can follow the deformation of the unit/component during testing. All loading pads shall be capable of pivoting in all directions. The pivot point shall be as close as practically possible to the load surface.

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.

B-2 FLOOR SURFACE.

The floor surface shall be horizontal, rigid and flat with a smooth surface. For the test in **7.6.2**, the surface shall be smooth decorative thermosetting synthetic resin bonded laminated sheets or equivalent.

B-3 STOPS

Devices shall be used to prevent the table from sliding or rolling but not tilting. They shall not be higher than 12 mm, except where the design of the bed necessitates the use of higher stops, in which case the lowest stop that will prevent the item from moving shall be used. If greater than 12 mm, the height of the stop used shall be recorded in the test report.

B-4 LOADING PAD

The loading pad shall be a rigid circular object, 200 mm in diameter and the face of which shall have a convex spherical curvature of 300 mm radius with a 12 mm front edge radius (*see* Fig. 16).

B-5 SMALL LOADING PAD

The small loading pad shall be a rigid disc 100 mm in diameter, with a flat face and a 12 mm front edge bend radius. Where space prevents the use of a 100 mm diameter loading pad, a 50 mm diameter loading pad with similar properties may be used.

B-6 TEST MATTRESS

The test mattress shall be a soft polyurethane foam sheet with a thickness of 100 mm, a bulk density of (35 ± 3.5) kg/m^3 and 40 percent indentation force deflection (IFD) of 170 N ± 40 N when tested as per **6** of IS 7888. The size shall be such as to overlap the size of the loading pad by at least 200 mm all round. The test mattress may have a light soft cotton cover with a mass not greater than 120 g/m^2.

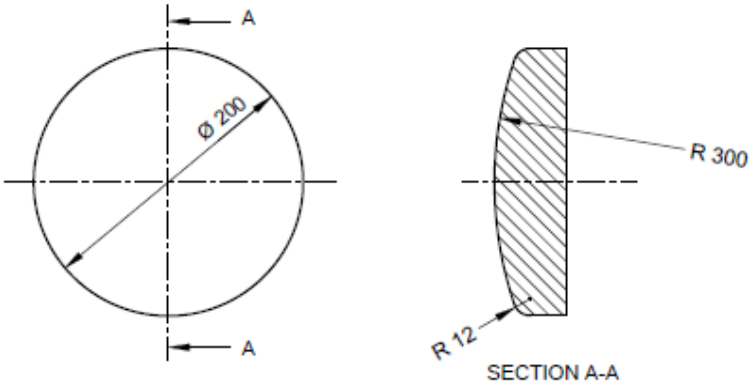
The same part of the standard test mattress shall not be reused within 2 h of the test and the mattress shall be replaced if damaged, or after 10 complete bed tests, whichever occurs first.

B-7 IMPACTOR

The impactor shall be as shown in Fig. 17 and comprised of the following:

B-7.1 Bag

Bag shall be 400 mm ± 15 mm in diameter and approximately 400 mm in height with a suitable arrangement to suspend from a lifting mechanism



All dimensions in millimetres

FIG. 16 LOADING PAD

like a rope and hook not inhibiting free fall while testing. The construction of the bag should be strong to withstand the repetitive testing cycles without tearing or puncturing. The bag should be made of a flexible and strong fabric like canvas with reinforcement straps and double seam stitching with a nylon like thread of appropriate strength.

B-7.2 Filling Media

The bag should contain enough media for achieving total weight of (64 ± 0.1) kg. The media can be sand or metal (shots, slugs, punches etc, lead media is not recommended for environment and health reasons) Media may be contained within smaller individual bags/compartments. Media shall not be a singular solid material (for example, single steel or concrete mass).

B-8 TEST BED BASE (UNFRAMED)

The slats should be made of solid wood with a minimum modulus of elasticity of 8 000 N/mm^2. The cross section of the slats shall be 20 mm × 95 mm and the distance between the slats shall be (60 ± 2) mm.

If the free span of the slats is > 1 000 mm, support the slats along the centre line. The length of the slats shall be 10 mm shorter than the nominal width of the bed frame.

B-9 TEST BED BASE (FRAMED)

The slats shall be as described in **B-8**. They shall be mounted on a frame made of wooden material defined in **B-7** with a cross section of 20 mm × 45 mm (*see* Fig. 18). The width of the bed base shall be 20 mm smaller than the nominal width of the bed frame.

B-10 TEST SUPPORT (UNFRAMED BED BASES)

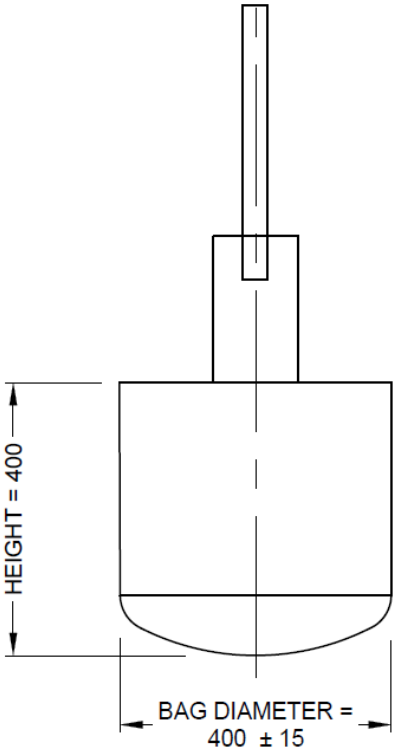
The base shall be suitably supported along its whole length. The total overhang on one side (*see* Fig. 19) shall be (20 ± 1) mm. If the bed base is not prevented from moving during the tests, it shall be fixed in a suitable manner.

B-11 TEST SUPPORT (FRAMED BED BASES)

Supports of 50 mm width, suitable to carry the bed base and the test loads shall be placed 150 mm from the ends of the frame (*see* Fig. 20).

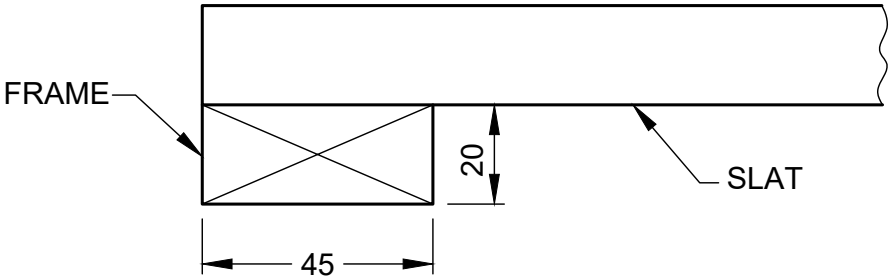
B-12 TEST MASS

A mass of 75 kg shall be distributed over an area of approximately 300 mm × 300 mm or a diameter of approximately 340 mm.



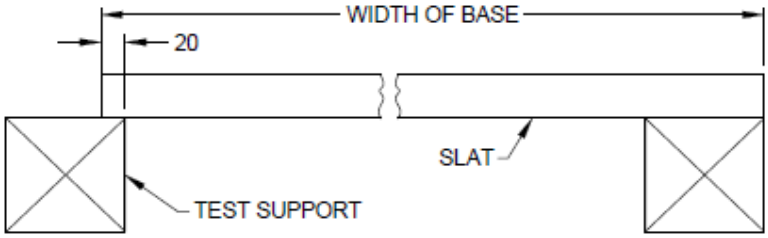
All dimensions in millimetres

FIG. 17 IMPACTOR



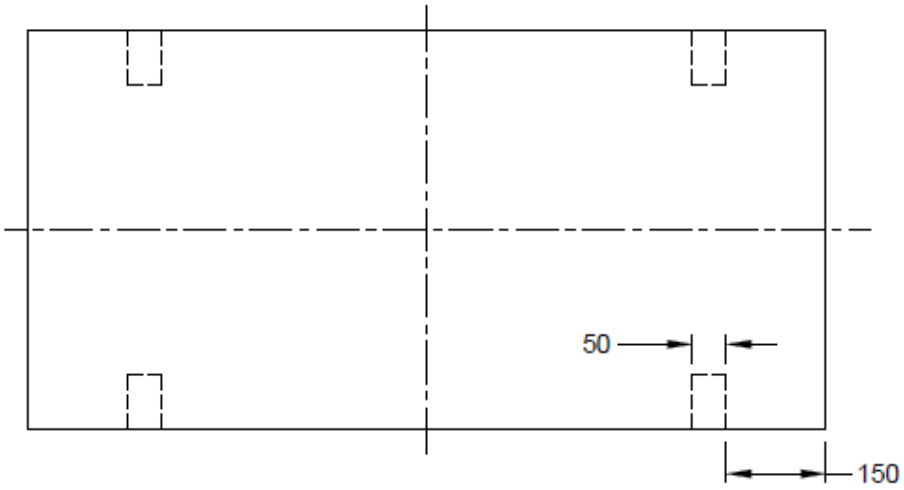
All dimensions in millimetres

FIG. 18 TEST BED BASE (FRAMED)



All dimensions in millimetres

FIG. 19 TEST SUPPORT (UNFRAMED BED BASES)



All dimensions in millimetres

FIG. 20 TEST SUPPORT (FRAMED BED BASES)

ANNEX C

(*Foreword*)

COMMITTEE COMPOSITION

Furniture Sectional Committee, CED 35

Organization	*Representative(s)*
In Personal Capacity (*II A, K-11, Ground Floor, Kailash Colony, New Delhi 110048*)	Shri Balbir Verma (***Chairman***)
Association of Furniture Manufacturers and Traders (I), Mumbai	Representative
Blowplast (BP) Ergonomics Ltd, Mumbai	Dr Nitin Sudame Dr Gita Piramal (*Alternate*)
Central Public Works Department, New Delhi	Shri A. K. Sharma Shrimati Nandni Mukopadhyay (*Alternate*)
Centre for Environmental Planning and Technology (CEPT) University, Ahmedabad	Prof Shrutie Tamboli Prof Snehal Nagarsheth (*Alternate*)
CSIR-Central Building Research Institute, Roorkee	Shri S. K. Negi Shri Ashok Kumar (*Alternate*)
Directorate of Education, Govt of NCT of Delhi, Delhi	Representative
Forest Research Institute, Dehradun	Dr Sadhna Tripathi Dr Kishan Kumar (*Alternate*)
Godrej & Boyce Mfg Co Ltd, Mumbai	Shri Ega Venkateshwarlu Shri Nirav Shah (*Alternate* I) Shri Lalitesh Mandrekar (*Alternate* II)
Government e-Marketplace, New Delhi	Representative
Indian Furniture Products Ltd (Zuari), Tiruvallur	Shri C. M. Satheesh Kumar Shri S. Saravanan (*Alternate*)
Institute of Indian Interior Designers, Mumbai	Shrimati Chirashree Thakkar
Kendriya Bhandar, New Delhi	Representative
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Ministry of Women and Child Development, New Delhi	Representative
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The Indian Institute of Architects, Mumbai	Ar Vikramray Pramodray Pandya

Organization	*Representative(s)*
The Supreme Industries Limited, New Delhi	Shri Sanjeev Jain Shri Mukesh Kaul (*Alternate* I) Shri Sanjay Dogra (*Alternate* II)
In Personal Capacity (*Pratap Nursery Lane, Near Gurudwara Sahib, Panditwari, Dehradun*)	Shri K. S. Pruthi
BIS Directorate General	Shri Sanjay Pant, Scientist 'F' and Head (Civil Engineering) [Representing Director General (*Ex-officio*)]

Member Secretary

Shri Pradeep Singh Shekhawat
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Review of Indian Standards

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