

भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS

Draft for comments only

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भारतीय मानक मसौदा

वस्त्रादि — पलंग के गद्दे — विशिष्टि
(आई एस 13489 का दूसरा पुनरीक्षण)

Draft Indian Standard

TEXTILES — BED MATTRESS — SPECIFICATION

(Second Revision of IS 13489)

ICS: 97.140

Made-up Textiles (Including Ready-Made Garments)
Sectional Committee, TXD 20

last date for receipt of comments is
16 November 2024

FOREWORD

(Formal clauses will be added later)

The bed mattress plays a pivotal role in determining the quality of our rest and, by extension, our overall health. With right balance of support mattress ease pressure points, maintain spinal alignment and posture. The bed mattress has undergone significant transformations, offering a wide variety of materials, and technologies aimed at enhancing sleep experiences. Different kind of bed mattress are currently in use from traditional coir mattress to innerspring systems mattress, advanced memory foam, latex, and hybrid mattresses.

This standard was originally published in 1992 and has been revised in 2000. This standard has been revised again to incorporate the following:

1. Scope has been modified to include spring and rebound foam mattresses;
2. Performance test for the mattress firmness and durability has been incorporated;
3. GSM requirement of top quilt fabric has been incorporated;
4. Requirements for bonnel and pocket springs have been incorporated;

5. Stitch density for polyester and nylon sewing threads have been incorporated;
6. BIS certification marking clause has been modified; and
7. References to Indian Standard have been updated.

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, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

1 SCOPE

This standard covers requirements for bed mattresses made from rubberized coir, flexible polyurethane or latex foam sheets, viscoelastic foam, re-bounded foam, bonnel/pocket spring or any of the combination of these materials.

2 REFERENCES

The standards listed in Annex A 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 Annex A.

3 TYPES

Bed mattress shall be of the following types:

Type 1 — Bed mattress made from rubberized coir sheet as cushioning/core material, mainly used by defence services, paramilitary organizations, police, railways, public works departments, etc.

Type 2 — Bed mattress made from rubberized coir, flexible polyurethane or latex foam sheet, Rebounded foam, bonnel/pocket spring either singly or in combination as core/cushioning materials.

NOTE — Single Rubberized coir sheets shall be covered under Type I and Rubberized coir sheets when used in combination with other core/cushioning materials shall be covered in Type 2.

4 DIMENSIONS

4.1 Type 1 Mattress

The principal dimensions of the finished mattress when measured to nearest 5 mm shall be as follows (*see Fig. 1*)

<i>Dimension, mm</i>	<i>Requirement</i>
Length	2000 ± 15
Width	910 ± 15
Thickness, <i>Min</i>	75

4.2 Type 2 Mattress

The principal dimensions of the finished mattress shall be as specified in the contract or order, subject to the following tolerance when measured to nearest 5 mm.

<i>Dimension, mm</i>	<i>Tolerance</i>
Length	± 15 mm
Width	± 15 mm
Thickness	± 05 mm

NOTE — In case more than one material is used for cushioning, thickness of the finished mattress shall conform to the requirements given above and the order of layering of cushion materials shall also be indicated.

5 REQUIREMENTS

5.1 The fabric used for top quilting shall confirm to the requirements specified in Table 1.

Table 1 Physical requirement of Top Quilt fabric used in Mattresses
(*Clause 5.1*)

SI No	Fabric type	Requirement	Method of Test, Ref to
		GSM, <i>Min</i>	
(1)	(2)	(3)	(4)
i)	Knitted polyester	180	IS 1964
ii)	Woven Polyester cotton blended	130	
iii)	Woven polyester	90	
iv)	Woven Cotton	150	IS 1964
v)	Jacquard weave fabric	130	

NOTE — Any other suitable fabric with different weave, fibre composition, fabric type, and GSM shall be as agreed to between buyer and seller.

5.2 Materials used for cushioning/core layers of bed mattress shall conform to the requirement as specified in Table 2, Table 3 and Table 4.

Table 2 Physical requirement of Cushioning/Core layers used in Mattress
(Clause 5.2)

SI No	Components	Material Requirement
(1)	(2)	(3)
i)	Cushioning/Core layers	a) Rubberized coir sheet conforming to IS 8391 (Part 1) b) Latex foam sheet conforming to IS 1741 c) Flexible polyurethane foam sheet conforming to IS 7933 d) Polyurethane Visco-elastic foam conforming to IS 7933 e) Re-bonded foam having minimum density 50kg/m ³ and conforming to IS 7933.

Table 3 Physical Requirements of Bonnel spring used in mattress
(Clause 5.2)

SI No	Characteristic	Requirements	Tolerance	Method of Test, Ref to
(1)	(2)	(3)	(4)	(5)
i)	Wire diameter	2.0 to 2.4 mm	± 0.02 mm	Annex B
ii)	Outer diameter	85 to 90 mm	—	Annex B
iii)	OD of spring in centre	45 to 50 mm	—	Annex B
iv)	Height of spring	120 to 160 mm	± 10 mm	Annex B
v)	No of turns	4 to 6		Visual

Table 4 Physical requirements of Pocket-spring used in mattresses
(Clause 5.2)

SI No	Characteristic	Requirements	Tolerance	Method of Test, Ref to
(1)	(2)	(3)	(4)	(5)
i)	Wire diameter	1.7 mm to 2.2 mm	± 0.02 mm	Annex B
ii)	End ring diameter	42 to 47 mm	—	Annex B
iii)	Outer diameter	50 to 70 mm	—	Annex B
iv)	Height of spring before pocketing	150 to 200 mm	± 10 mm	Annex B
v)	No of turns	5 to 8	—	Visual

5.3 The mattress when tested as per ISO 23769 shall have maximum height loss of 10% and firmness loss of 30%.

6 MANUFACTURE

6.1 The top and bottom pieces of the mattress case may be made from a single piece of fabric. One joint parallel to the length may, however, be permitted both in the top and bottom of the case but no piece less than 18 cm in width shall be used. The sides, shall also be made from the same fabric which shall have a maximum of four joints. However, no lateral joint of any cushioning material shall be allowed parallel to length/width. The mattress case shall be plain or quilted with single or multilayers of foam.

6.2 The piping shall be made by encasing a 4 mm hemp line (*see* IS 1920) or shroud-laid cotton line (*see* IS 3252) in a 50 mm wide strip of fabric used for case. The top portion of the piping and the side border shall be stitched together by one row of machine stitching. The stitching shall be at least 5 mm away from the raw edges. Similarly, the bottom portion of the piping and the border (sides) shall also be machine stitched.

NOTE — Piping and hemp line is only applicable to hand stitched mattresses.

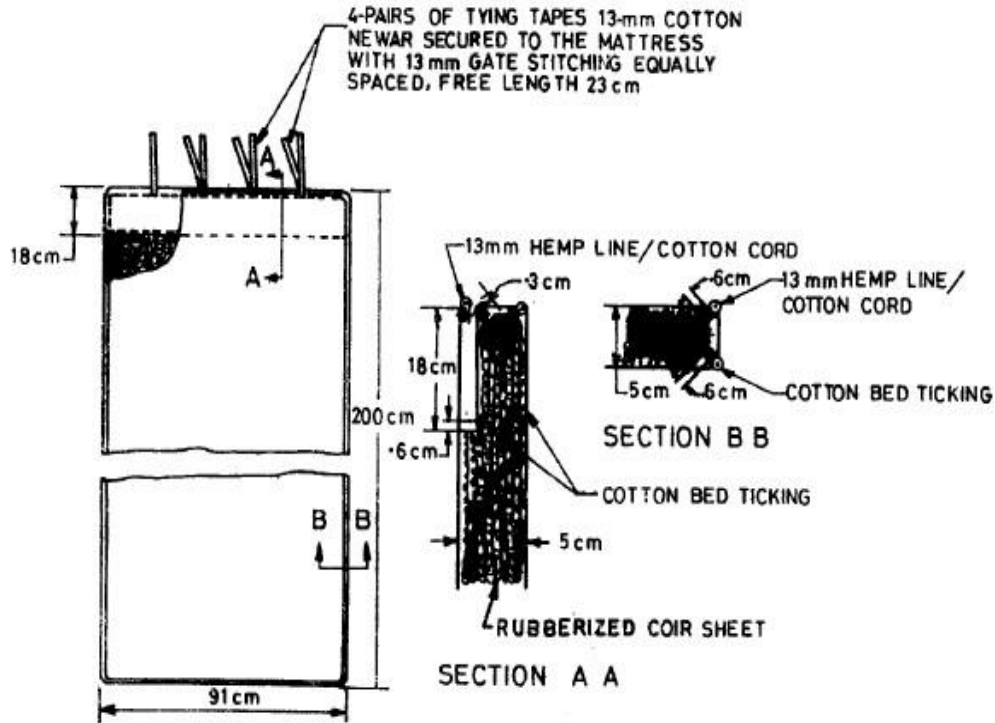


FIG 1 BED MATTRESS (HAND STITCHED)

6.3 The mattress shall be assembled throughout with lock stitch or chain stitch regulated at 37 to 43 stitches per decimetre for cotton sewing thread (*see* IS 1720) and minimum 25 stitches per decimeter for polyester or nylon sewing thread. All loose ends shall be securely fastened.

6.4 For the hand stitched mattresses, one of the ends shall however be unstitched and kept open for insertion of cushioning material. For Type 1, the free edge of the bottom and the piping shall be stitched with the lower edge of the border to which a flap of 18 cm width has been stitched. Four pairs of 13 mm tying tapes (*see* IS 1895) shall be stitched, as indicated in Fig. 1, one tape each to the free edge of the bottom and the other to the lower edge of the border. The other side of the flap shall be hemmed 10 mm wide with one row of stitching. The sheet of cushioning material shall be inserted into the case through the open end. The open end shall be closed by the flap and secured by tying tapes.

For Type 2 mattress, after inserting the cushioning material, the free edge of the bottom and the piping shall be stitched with the lower edge of the border after hemming it to 10 mm with single row of stitching.

NOTE — For the mattresses stitched using tape edge machine requirements listed in clause 6.4 shall not be applicable.

6.5 If a sealed sample is stipulated in the contract/order, the mattress shall conform to the same in respect of workmanship, finish, etc.

7 MARKING

7.1 Each mattress shall be marked with the following:

- a) Name of manufacturer;
- b) Type;
- c) Dimensions;
- d) Type of cushioning/core material used; and

NOTE — In case more than one material is used for cushioning, thickness and grade of each shall be indicated separately.

- e) Other information stipulated in the contract/order.

7.2 BIS Certification Marking

The bed mattresses may also be marked with Standard Mark.

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

8 PACKING

8.1 Type 1 mattress shall be packed as detailed in **8.1.1** to **8.1.3** when so specified in the contract or order:

8.1.1 *Materials*

- a) Polythene film, 0.04 mm thick (*see* IS 2508);
- b) Cloth heavy cee (*see* IS 3751) or Cloth hessian (Medium), 305g/m² (*see* IS 2818);
and
- c) Twine jute, 3-ply (*see* IS 1912) or String cord as specified in contract/order

8.1.2 *Method*

One mattress shall be wrapped with an inner layer of polythene film 0.04 mm thick (*Min*) and an outer layer of cloth heavy cee or equivalent hessian cloth to form a compact bale of rectangular shape as far as possible. The overlap of the inner wrapping shall be at least 10 cm so as to ensure full protection to the contents of the bale. The overlap of the outer layer of the hessian cloth shall be such that it can be properly and securely sewn around the bale. The bale shall be stitched with double 3-ply-jute twine, with not less than 12 stitches per decimetre taking care not to pierce the inner wrapping while stitching. Sufficient hessian cloth shall be provided at each corner to form 'ears' of about 15 cm in length to facilitate easy handling during transit.

8.1.3 Each bale shall be legibly marked by stencil with indelible marking ink/paint showing the following details:

- a) Manufacturer's name and address;
- b) Name and type;
- c) Quantity packed in the bale;
- d) Lot number and serial number of the bale;
- e) Month and year of packing;
- f) Gross mass of the bale in kg;
- g) Name and address of consignee; and
- h) Any other information required by the buyer.

8.2 Type 2 mattresses may be supplied loose or packed in a manner as specified in the contract or order.

9 SAMPLING

9.1 Lot

The number of pieces of the mattresses of the same type and same quality delivered to a buyer against one dispatch note shall constitute a lot.

9.2 The conformity of the lot to the various requirements specified in the standard shall be determined on the basis of tests carried out on the sample selected from the lot.

9.3 Unless otherwise agreed, the number of pieces selected at random for inspection shall be in accordance with Table 5.

9.4 For selection of samples at random from the lot, procedure given in IS 4905 may be followed.

9.5 Number of Samples and Criteria for Conformity

It shall be as follows:

Table 5 Sample Size
(Clauses 9.3, 9.6 and 9.7)

Sl No.	Lot Size	Sample Size	Sub-sample Size	Permissible Number of Non-conforming Pieces
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	5	3	0
ii)	50 to 150	8	5	0
iii)	151 to 280	13	8	0

iv)	281 to 500	20	8	0
v)	501 to 1 200	32	13	0
vi)	1 201 to 3 200	50	13	0
vii)	3 201 to above	80	20	1

9.6 The number of pieces to be selected for dimensions, stitches/dm shall be in accordance with col (3) of Table 5.

For all other tests such as Blend composition, identification of different components used in mattresses selected shall be as given in col (4) of Table 5.

9.7 The lot shall be considered as conforming to the requirements of this standard if all the samples tested in accordance with col (3) of Table 5 found conforming and also the total number of defective pieces is less than or equal to the acceptance number given in col (5) of Table 5 for sub sample size.

ANNEX A (Clause 2)

LIST OF REFERRED STANDARDS

<i>IS No</i>	<i>Title</i>
IS 1720 : 1978	Specification for cotton sewing thread (<i>first revision</i>)
IS 1741 : 2019	Latex Foam Rubber Products — Specification (<i>first revision</i>)
IS 1895 : 1982	Specification for cotton NEWAR (<i>second revision</i>)
IS 1912 : 2023	Textiles — Country Jute Twine — Specification (<i>third revision</i>)
IS 1920 : 2023	Textiles - Hemp lines - Specification (<i>third revision</i>)
IS 1964 : 2001	Textiles — Methods for Determination of Mass Per Unit Length and Mass Per Unit Area of Fabrics (<i>second revision</i>)
IS 2508 : 2016	Polyethylene Films and Sheets — Specification (<i>third revision</i>)
IS 2818 : 2015	Textiles — Hessian — Specification (<i>third revision</i>)
IS 3252 : 2023	Textiles - Shroud-laid cotton line – Specification (<i>third revision</i>)
IS 3751 : 1993	Textiles — Heavy cee jute cloth — Specification (<i>first revision</i>)
IS 4905 : 2015	Random sampling and randomization procedures (<i>first revision</i>)
IS 7933 : 2022	Flexible Polyurethane Foam for Domestic Mattresses — Specification (<i>first revision</i>)

IS 8391 (Part 1) : 2019	Rubberized Coir Sheets for Cushioning — Specification Part 1 Curled (<i>third revision</i>)
ISO 23769:2021	Furniture — Mattresses — Test methods for the determination of functional characteristics

Annex B
(*Clause 5.2*)

METHOD OF TEST TO MEASURE DIAMETER AND HEIGHT OF SPRING

B-1 APPARATUS

Vernier calliper and measuring scale

B-2 PROCEDURE

Ensure the Vernier caliper is clean, and its jaws are free from debris. Zero the Vernier caliper by closing the jaws and adjusting the zero mark on the Vernier scale. Open the jaws of the caliper slightly wider than the wire's dimension. Diameter shall be measured at three different points along the length of the specimen. For the height of spring, keep the spring on a flat surface and use a graduated measuring scale, measure the height at three different locations.

B-3 RESULT

Report the average value of diameter and height of spring dimensions.