भारतीय मानक ब्यूरो

भारतीय मानक मसौदा

चिकित्सीय वस्त्रादि – अविसंक्रमित अवशोषक सूती जालीदार कपडा – विशिष्टि

(आई एस 758 *का पांचवा पुनरीक्षण*)

BUREAU OF INDIAN STANDARDS

Draft *Indian Standard*

MEDICAL TEXTILES — COTTON ABSORBENT GAUZE — SPECIFICATION

(*Fifth Revision of* IS 758)

ICS 11.040.30; 59.080.99

Last date for receipt of comment is 17 February 2023

FOREWORD

(*Formal clause will be added later*)

This standard was first published in 1955 and subsequently revised in 1969, 1975, 1982 and 1988. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) Title and scope of the standard has been updated.
b) Amendments 1 and 2 have been incorporated;
c) Definition of cotton absorbent gauze and fabric defects has been updated;
d) Fibre identification test has been specified;
e) Sterility test (optional) has been specified.
f) References to Indian Standards have been updated;
g) BIS certification marking clause has been updated;
h) Marking and packing clauses have been updated; and
i) Sampling and criteria of conformity has been modified.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final values, observed or calculated, expressing the results of tests, 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 values should be the same as that of the specified values in this standard.

1 SCOPE

This standard prescribes the constructional particulars and other requirements of bleached and unmedicated absorbent cotton gauze.

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 MANUFACTURE

3.1 Yarn — The cotton yarn used in the manufacture of gauze shall conform to the requirements specified in IS 171.

3.2 Cloth — Absorbent gauze is cotton fabric of plain weave, supplied in various widths and lengths. It shall be free from weaving defects, sizing, dressing and filling materials, and substances liable to cause subsequent tendering. The fabric shall be reasonably free from holes, slubs, snarls and naps as well as the following when examined visually: -

i) *Odour* - Misty odour, or any objectionable smell like that of chemicals or materials used in sizing and bleaching.

ii) *Defective Selvedge* - The selvedge tearing and allowing yarn to unravel and loop formation at selvedge.

iii) *Cracks*.- Prominent steaks of space or gaps between warp or weft yarns.

iv) *Double ends* - More warp threads woven as one, due to wrong draw.

v) *Sloughing* - Entanglement in the fabric of a bulk of yarn that has slipped off the weft yarn due to loose winding.

4 REQUIREMENTS

4.1 Fibre Identification

The material of gauze cloth that is cotton fibre shall be identified by the method prescribed in IS 14944.

4.2 The gauze cloth shall also conform to the requirements given in Table 1.

Table 1 Requirements of Absorbent Cotton Gauze

(*Clause* 4.2)

Sl. No.	Characteristics	Requirements	Method Of Test, Ref To (*See* NOTE 1)

(1)	(2)	(3)	(4)
i)	Count of yarn (for guidance only) a) Warp b) Weft	 17 to 25 tex (24s to 34 s) 17 to 25 tex (24s to 34 s)	
ii)	Threads/dm a) Ends, *Min* b) Picks, *Min*	 75 55	Annex B
iii)	Mass, g/m^2	30 ±5	IS 1964 (*see* Note 2)
iv)	Length, m tolerance	Not less than 98 percent of agreed or declared value	IS 1954
v)	Width, cm tolerance	Not less than 98 percent of agreed or declared value	Annex B
vi)	Absorbency, *s*, Max	10	IS 2369
vii)	*p*H value of aqueous extract	6.5 to 8.5	IS 1390
viii)	Scouring loss, percent, *Max*	1	IS 1383 (mild method)
ix)	Freedom from optical whitener	No fluorescence (Not more than occasional point of fluorescence visible)	Viewing under ultra-violet light
x)	Sterility (optional)	Complies with test	IS 10150

NOTES

1 The test specimens may be tested in the prevailing atmospheric conditions. However, in case of disputes, the specimens shall be conditioned and tested in the standard atmospheric conditions as specified in the Indian Standards referred on test methods.

2 In case mass is to be determined by oven-dry weight method (method B) or moisture regain value method (method C), the value of the commercial moisture regain (R) shall be taken as 7.0 percent.

5 MARKING

5.1 Each packet shall have a label marked with the following information:

a) Name of the material;
b) Manufacturer's name, initials or trademark;
c) Lot No./Batch No.;
d) Month and year of manufacture;
e) Width in centimetres and length in metres;
f) The words Sterilized or Non-Sterilized; and
g) Any other statutory requirement as required by the law in force or as agreed between buyer and seller.

5.1.1 *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 the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product may be marked with the Standard Mark.

6 PACKING

6.1 Gauze cloth shall be folded and packed with such material and in a manner so as to protect its absorbency and allow normal handling and transport without tearing and exposing the content. Details of the packing shall be a matter of prior agreement between the buyer and the seller.

6.1.1 A suitable packing procedure is given in Annex C for information and guidance.

7 SAMPLING AND CRITERIA OF CONFORMITY

7.1 Lot — The quantity of absorbent cotton gauze cloth delivered to one buyer against one dispatch note shall constitute a lot.

7.2 The conformity of a lot to the requirements of the standard shall be determined on the basis of the tests carried out on the sample selected from the lot.

7.3 Unless otherwise agreed to between the buyer and the seller, the number of pieces to be selected at random shall be in accordance with column 2 and 3 of Table 2 to ensure the randomness of IS 4905 may be used.

Table 2 Sample Size and Criteria for Conformity
(*Clause* 7.3)

Sl No.	Lot Size	Sample Size	Permissible Number of Non-conforming Pieces	Sub-sample Size
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	5	0	2
ii)	51 to 150	8	0	3
iii)	151 to 300	13	1	3
iv)	301 to 500	20	1	5
v)	501 and above	32	2	5

7.4 Number of Tests and Criteria for Conformity

Characteristics	Number of Tests	Criteria for Conformity
Count, ends, picks, mass, length, width and visual defects	According to column 3 of Table 2	Permissible number of non-conforming pieces not to exceed the corresponding number given in co1umn 4 of Table 2
Absorbency, scouring loss, fibre identification, pH value,	According to column 5 of table 2	All the test pieces shall meet the requirements

sterlity and freedom from optical whitener		

ANNEX A
(*Clause* 2)

IS No.	*Title*
IS 171 : 1993	Textiles — Ring spun grey cotton yarn for weaving – Specification (*fourth revision*)
IS 1383 : 1977	Methods for determination of scouring loss in grey and finished cotton textile materials (*first revision*)
IS 1390 : 2022	Textiles — Determination of pH of aqueous extract (*third revision*)
IS 1398 : 1982	Specification for packing paper, waterproof, bitumen laminated (*second revision*).
IS 1954 : 1990	Determination of length and width of woven fabrics – Methods (*second revision*)
IS 1963 : 1981	Methods for determination of threads per unit length in woven fabrics (*second revision*)
IS 1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*)
IS 2369 : 2022	Method for determination of absorbency of absorbent textile materials (*second revision*)
IS 2508 : 2016	Polyethylene films and sheets - Specification (*third revision*)
IS 2818 : 2015	Textiles — Hessian — Specification (*third revision*)
IS 4905 : 2015	Random sampling and randomization procedures (first revision)
IS 10150 : 1981	Guide for sterilization of medical products
IS 14944 : 2020	Surgical dressings — Methods of test (*first revision*)

ANNEX B
(*Clause* 4.2 and *Table* 1)

METHOD FOR DETERMINATION OF THREADS AND WIDTH OF FABRIC

B-1 For determining the threads per decimetre and width of the fabric, the cloth shall be laid as given below.

B-2 Stick one of the selvedges of the gauze cloth measuring 25 cm (in length) × full width to the canvas cloth, slightly bigger in size, by means of an adhesive tape. Attach a metal plate measuring approximately 25 cm × 2 cm and weighing approximately 75 g to the other selvedge of the gauze cloth by means of an adhesive tape. Suspend the whole assembly in the vertical position for 30 seconds. Thereafter, stick the hanging selvedge of the gauze cloth to the canvas by means of adhesive tape. Spread the gauze cloth in this state on a glass plate taking care that the sample remains in stretch conditions on the canvas cloth.

B-2.1 Determine the threads per decimetre according to the method given in IS 1963.

B-2.2 Determine the width of the fabric as per method given in IS 1954.

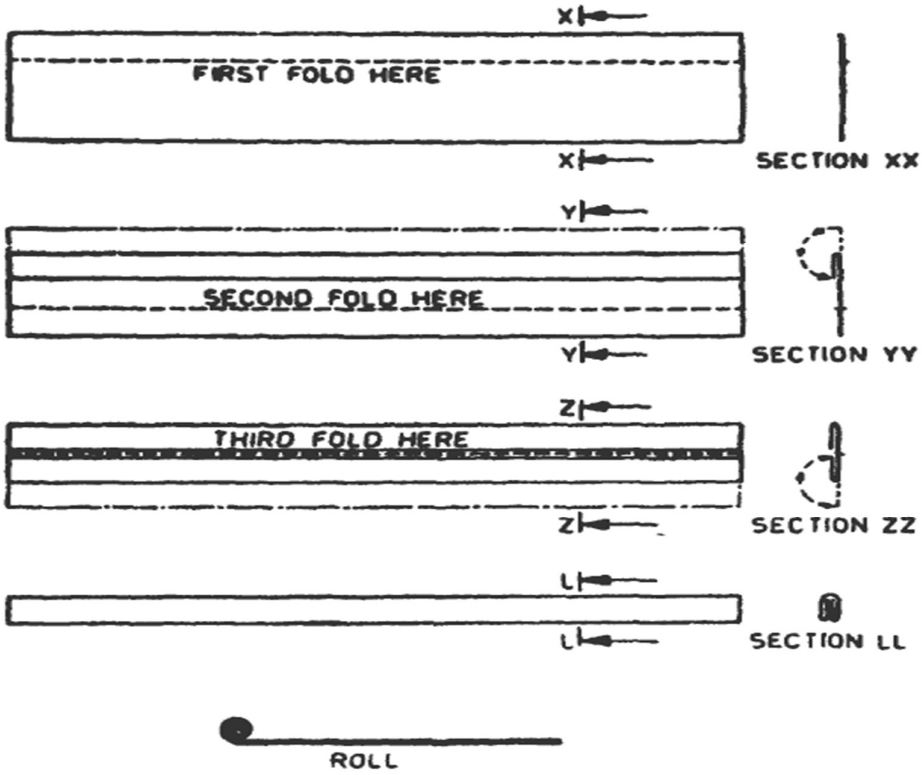

FIG. 2 METHOD OF FOLDING COTTON GAUZE IN ROLLS

ANNEX C
(*Clause* 6.1.1)

PACKING PROCEDURE OF GAUZE

C-1 The number of dressings per packet and the number of packets per bale shall be as agreed to between the buyer and the seller.

C-2 The packets shall be wrapped with the following materials:

a) One layer of waterproof paper (*see* IS 1398)

or

One layer of polyethylene film of 40 microns thickness (*see* IS 2508).
Waterproof paper of polyethylene film shall have an overlap of at least 15 cm.

b) One layer of hessian conforming to IS 2818.

C-3 The outer layer of bale, that is, the hessian shall be securely sewn with at least 12 stitches per decimetre. The slats of timber approximately 80 mm wide and 12 mm thick shall be placed lengthwise along the edges of the bale and three steel balling hoops shall be used to tighten the bale and hold the slats in position. The hoops shall preferably be machine-sealed and made firm by rivets.

C-4 Unless otherwise specified, the packets of one size of gauze shall be packed in a bale of the gross weight not exceeding 37 kg.

C-5 Press packing of bales shall be carried out, wherever possible.

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चिकित्सीय वस्त्रादि – सूती कपडे की पट्टियां – विशिष्टि

(आई एस 863 *का तीसरा पुनरीक्षण*)

BUREAU OF INDIAN STANDARDS

Draft *Indian Standard*

MEDICAL TEXTILES — COTTON BANDAGE CLOTH — SPECIFICATION

(*third revision of* IS 863)

ICS 11.040.30; 59.080.99

Last date for receipt of comment is 17 February 2023

FOREWORD

(*Formal clause will be added later*)

This standard was first published in 1956 and subsequently revised in 1969 and 1988. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) Title and scope of the standard has been updated.
b) All amendments have been incorporated;
c) The fabric defects have been updated;
d) Fibre identification test has been specified;
e) Sterility test (optional) has been specified.
f) References to Indian Standards have been updated;
g) BIS certification marking clause has been updated;
h) Marking and packing clauses have been updated; and
i) Sampling and criteria of conformity has been modified.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final values, observed or calculated, expressing the results of tests, 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 values should be the same as that of the specified values in this standard.

1 SCOPE

This standard prescribes the constructional particulars, and other requirements for cotton bandage cloth, bleached or dyed.'

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 MANUFACTURE

3.1 Yarn —The cotton yarn used in the manufacture of bandage cloth shall conform to the requirements specified in IS 171.

3.2 Cloth — The cloth shall be woven in plain weave with well-formed selvedge and free from weaving defects. It shall also be free from filling, sizing or dressing material. The cloth shall also be bleached. The fabric shall be reasonably free from holes, slubs, snarls and naps as well as the following when examined visually: -

i) *Odour* - Misty odour, or any objectionable smell like that of chemicals or materials used in sizing and bleaching.

ii) *Defective Selvedge* - The selvedge tearing and allowing yarn to unravel and loop formation at selvedge.

iii) *Skewness* - A condition where warp and weft do not keep at right angles to each other.

iv) *Cracks* - Prominent steaks of space or gaps between warp or weft yarns.

v) *Double ends* - More warp threads woven as one, due to wrong draw.

vi) *Sloughing* - Entanglement in the fabric of a bulk of yarn that has slipped off the weft yarn due to loose winding.

3.2.1 If agreed to between the buyer and the seller, the bandage cloth may be cut according to the agreed dimension and supplied in roll form. The selvedge shall not be included in cut bandages. Both the extreme edges shall be straight and evenly cut with reasonable freedom from loose threads.

4 REQUIREMENTS

4.1 Fibre Identification

The material of bandage cloth that is cotton fibre shall be identified by the method prescribed in IS 14944.

4.2 The bandage cloth shall conform to the requirements specified in Table 1.

Table 1 Requirements for Cotton Bandage Cloth and Cut Bandages
(*Clause* 4.2)

Sl. No.	Characteristics	Requirements	Method of Test (*See* NOTE 1)
(1)	(2)	(3)	(4)
i)	Count of yarn (for guidance only) a) Warp b) Weft	 20 to 25 tex (24^s to 30^s) 25 to 30 tex (20^s to 24^s)	
ii)	Threads, dm, *Min* a) Ends b) Picks	 150 85	IS 1963
iii)	Mass, g/m2	57 ± 5	IS 1964 (*see* Note 2)
iv)	Length, m, tolerance	Not less than 99 percent of agreed or declared value	IS 1954
v)	Width, m, tolerance	Not less than 99 percent of agreed or declared value	IS 1954
vi)	pH value of acqueous extract	6.5 to 8.5	IS 1390
vii)	Scouring loss, percent, *Max*	2.0	IS 1383 (Mild Method)
viii)	Freedom from optical whiteners	Absence of fluorescence	Viewing under ultra-violet

		(not more than an occasional point of fluorescence visible)	light
(ix)	Colour fastness: (*see* NOTE 3) a) Light	4 or better	IS/ISO 105-B01 or IS/ISO 105-B02
	b) Washing (A1S) a) Change in colour b) Staining on adjacent fabric	 4 or better 4 or better	IS/ISO 105-C10
x)	Sterility (optional)	Complies with test	IS 10150

NOTES

1 The test specimens may be tested in prevailing atmospheric conditions. However, in case of disputes, the specimens shall be conditioned and tested in the standard atmosphere as specified in the Indian Standards referred on test methods.

2 In case mass is to be determined by oven dry weight method (Method B) or moisture regain value method (Method C), the value of the commercial moisture regain (R) shall be taken as 7.0 percent.

3 Colour fastness requirement is applicable to dyed cloth only.

5 PACKING

5.1 Bandage cloth shall be packed securely so as to allow normal handling and transport without tearing and exposing the contents. In case of cut and rolled bandages each bandage shall be wrapped in a suitable paper. Details of the packing shall be as agreed to between the buyer and the seller.

5.1.1 A suitable packing procedure is given in Annex B for information and guidance.

6 MARKING

6.1 Each packet of bandage cloth shall be legibly marked with the following information:

a) Name of the material;
b) Manufacturer's name, initials or trademark, if any;
c) Lot No./Batch No.;
d) Month and year of manufacture;
e) Length (m) and width (cm);
f) The words Sterilized or Non-Sterilized; and
g) Any other statutory requirement as required by the law in force or as agreed between buyer and seller.

6.1.1 *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 the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product may be marked with the Standard Mark.

7 SAMPLING AND CRITERIA OF CONFORMITY

7.1 Lot — The quantity of cotton bandage cloth delivered to one buyer against one dispatch note shall constitute a lot.

7.2 The conformity of a lot to the requirements of the standard shall be determined on the basis of the tests carried out on the sample selected from the lot.

7.3 Unless otherwise agreed to between the buyer and the seller, the number of pieces to be selected at random shall be in accordance with column 2 and 3 of Table 2 to ensure the randomness of IS 4905 may be used.

Table 2 Sample Size and Criteria for Conformity
(*Clause* 7.3)

Sl No.	Lot Size	Sample Size	Permissible Number of Non-conforming Pieces	Sub-sample Size
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	5	0	2
ii)	51 to 150	8	0	3
iii)	151 to 300	13	1	3
iv)	301 to 500	20	1	5
v)	501 and above	32	2	5

7.4 Number of Tests and Criteria for Conformity

Characteristics	Number of Tests	Criteria for Conformity
Count, ends, picks, mass, length, width and visual defects	According to column 3 of Table 2	Permissible number of non-conforming pieces not to exceed the corresponding number given in co1umn 4 of Table 2
Scouring loss, fibre identification, pH value, sterility, colorfastness and freedom from optical whitener	According to column 5 of table 2	All the test pieces shall meet the requirements

ANNEX A
(*Clause* 2)

IS No.	*Title*
IS 171 : 1993	Textiles – Ring spun grey cotton yarn for weaving – Specification (*fourth revision*)
IS 1383 : 1977	Methods for determination of scouring loss in grey and finished cotton textile materials (*first revision*)
IS 1390 : 2019	Textiles – Determination of *p*H of aqueous extract (*second revision*)
IS 1397 : 2020	Kraft paper for packing and wrapping — Specification (*third revision*)
IS 1398 : 1982	
IS 1954 : 1990	Determination of length and width of woven fabrics – Methods (*second revision*)
IS 1963 : 1981	Methods for determination of threads per unit length in woven fabrics (*second revision*)
IS 1964 : 2001	Textiles – Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*)
IS 2818 : 2015	Textiles — Hessian — Specification (*third revision*)
IS 14944 : 2020	Surgical dressings — Methods of test (*first revision*)
IS/ISO 105-B01 : 2014	Textiles — Tests for colour fastness Part B01 Colour fastness to light: Daylight
IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness Part B02 Colour fastness to artificial light: Xenon arc fading lamp test
IS/ISO 105-C10 : 2006	Textiles — Tests for colour fastness Part C10 Colour fastness to washing with soap or soap and soda
IS 2508 : 2016	Polyethylene films and sheets - Specification (*third revision*)

IS 1398 : 1982	Specification for packing paper, waterproof, bitumen laminated (*second revision*).

IS 2818 : 2015	Textiles — Hessian — Specification (*third revision*)
IS 4905 : 2015	Random sampling and randomization procedures (first revision)
IS 10150 : 1981	Guide for sterilization of medical products

ANNEX B
(*Clause* 5.1.1)

PROCEDURE FOR PACKING COTTON BANDAGE CLOTH AND CUT BANDAGES

B-1 The bandage cloth, suitably folded one over the other, shall be wrapped with two layers of kraft paper (*see* IS 1397).

B-2 Cut bandages shall be made into rolls (dressings). Each dressing shall be neatly and securely wrapped with blue or brown paper wrapping around its circumference only leaving the ends uncovered. Ten (or twenty in case of smaller size, for example, 2.5 cm width) such dressings shall then be wrapped in kraft paper (*see* IS 1397) to form a packet. The packet shall be securely glued or gummed at each end.

B-3 The packets as obtained in **B-1** and **B-2** shall be wrapped with the following materials:

a) One layer of waterproof (*see* IS 1398)

or

One layer of polyethylene film of 40 micron thickness (*see* Grade 123 of IS 2508). Waterproof paper or polyethylene film shall have an overlap of at least 15 cm.

b) One layer of hessian conforming to IS 2818.

B-4 The outer layer of bale, that is, the hessian, shall be securely sewn with at least 12 stitches per decimeter. The slats of timber approximately 80 mm wide and 12 mm thick shall be placed lengthwise along the edges of the bale and three steel baling hoops shall be used to tighten the bale and hold the slats in position. The hoops shall preferably be machine sealed and made from the rivets.

B-5 Unless otherwise specified, the gross weight of bale shall not exceed 37 kg.

B-6 Press packing of bale shall be carried out, wherever possible.

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चिकित्सीय वस्त्रादि – जिंक ऑक्साइड इलास्टिक आसंजक पट्टियां – विशिष्टि

(आई एस 4739 का दूसरा पुनरीक्षण)

BUREAU OF INDIAN STANDARDS

Draft Indian Standard

MEDICAL TEXTILES — ZINC OXIDE ELASTIC ADHESIVE BANDAGE — SPECIFICATION

(*second revision of* IS 4739)

ICS 11.040.30; 59.080.99

Last date for receipt of comment is 23 February 2023

FOREWORD

(*Formal clause will be added later*)

This standard was first published in 1968 and subsequently revised in 1986. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) The title of the standard has been modified;
b) Amendments have been incorporated;
c) The tolerance for the weight, end per dm, picks per dm have been modified;
d) Test method for weight has been modified;
e) Additional dimension of width of bandage have been specified;
f) The method of test for stretchability/elasticity has been updated;
g) The additional requirement of pH test has been specified;
h) The test method and minimum requirement of adhesion strength of plaster has been modified;
i) Reference to Indian standards have been updated;
j) BIS certification marking clause has been updated; and
k) Marking and packing clauses have been updated.

Zinc oxide elastic adhesive bandage consists of a plain or needle loom weave elastic cloth spread evenly on one side with a adhesive mass containing zinc oxide. This bandage adheres closely to skin at body temperature and does not require warming before application.

It is used to give light support and compression in case of fractured ribs or clavicles, in sprained joints, varicose veins and leg ulcers. It is also used to secure dressings and appliances.

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 : 2022 'Rules for rounding off numerical values (*second 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.

1 SCOPE

This standard cover requirements pertaining to the material, construction and performance of zinc oxide elastic adhesive bandage.

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 MATERIALS

3.1 Basic Cloth

3.1.1 Basic cloth shall be plain-woven cotton cloth. The weft threads can be soft-spun cotton or rayon or combination of cotton and rayon. It shall be reasonably free from spinning, weaving and processing defects. The cloth shall be bleached white or tinted flesh with a suitable dye. The edges of the bandage may be indicated as fast edges.

3.1.2 The cloth shall be woven two threads right twist (Z) and two threads reverse twist (S) along the warp. It shall conform to particulars given in Table 1.

Table 1 Manufacturing Particulars of Basic Cloth
(*Clause* 3.1.2)

Sl No.	**Universal Count (Cotton Count) of Yarn (Approx) (*see note)**		**Ends Per Dm,** *Min*	**Picks Per Dm,** *Min*	**Minimum No of Turns Per cm (*see note)**		**Weight g/m^2,** *Min*
	Warp	Weft			Warp	Weft	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
i)	23 tex × 2 (or 26s/2)	70 tex × 2 (or 8s/2)	174	80	18	–	140
Method of Test	–	–	IS 1963		IS 832 (Part 1) or IS 832 (Part 2)		IS 14944
NOTE — Count and turn per count are given for guidance purpose only.							

3.2 Adhesive Material — It shall be adhesive mass containing zinc oxide and free from toxic material and material known to be injurious to cloth.

4 DIMENSIONS

4.1 The stretched bandage shall be either of the following sizes:

Width cm	*Length (stretched) m*
5	4 to 6
6	
7.5	
8	
10	
15	

The stretched length and width shall not be less than 95 percent of the stated length and width respectively when tested by the stretchability/elasticity test as specified in IS 14944.

NOTE — Other dimensions as agreed between the buyer and the seller may also be permitted.

5 MANUFACTURE

5.1 The adhesive mass shall be spread evenly and uniformly over the bandage and shall not be less than 120 gm/m^2 when tested according to method given in **Annex B** and calculated from unstretched width and fully-stretched length.

5.2 Zinc oxide content shall be not less than 10 percent, calculated as zinc oxide, when determined according to method given in **Annex C**.

6 PERFORMANCE

6.1 Stretchability and Recovery

6.1.1 *Stretchability* — The stretchability of the bandage shall not be less than 65 percent when tested according to method given in **Annex D.**

6.1.2 *Recovery* — The length of the test specimen of the stretched bandage after release shall not be more than four-fifths of the stretched length when determined according to method given in **Annex D.**

6.2 Adhesive Strength

The adhesive strength of plaster shall be minimum 100 g/cm when tested as per method given in IS 14944.

6.3 pH Test

The zinc oxide elastic adhesive bandage shall have the pH value (aqueous extract) between 6.5 to 8.5 when determined as per method given in IS 1390.

7 TESTS

7.1 Test for various requirements shall be conducted as prescribed in appropriate annex and relevant clauses of this standard.

7.2 Conditioning — Each roll selected for test shall be conditioned for a minimum period of 24 hrs at 27 ± 2°C and 65 ± 2 percent relative humidity (*see* IS 196) prior to testing and testing shall be in the same atmosphere. When the tests cannot be carried out in the same atmosphere, then the testing shall be commenced within 2 min of withdrawal of the specimens from the conditioning atmosphere.

7.3 The three outer layers of each roll shall be discarded before taking specimens for test.

7.4 All specimens shall be removed from the roll at an approximate speed of 30 cm/min.

7.5 The adhesive surface shall not be permitted to come in contact with the fingers, or to be contaminated with dust, or to come in contact with foreign matter.

8 PACKING

8.1 The zinc oxide elastic adhesive bandage shall be wound on a spool, wrapped in suitable paper and packed in suitable containers as agreed to between the purchaser and the manufacturer.

8.2 The zinc oxide elastic adhesive bandage shall be packed securely so as to allow normal handling and transport without tearing and exposing the contents. Details of the packing shall be as agreed to between the buyer and the seller. Packaging of the product shall be such as to maintain the integrity of the product throughout its shelf life.

9 SAMPLING AND CRITERIA FOR CONFORMITY

Sampling and acceptance criteria for zinc oxide elastic adhesive bandage shall be as agreed to between the purchaser and the supplier. A recommended scheme for the same has been given in **Annex E**.

10 MARKING

10.1 Each container/package shall be legibly and indelibly marked with the following information:

a) Manufacturer's name, trade-mark, and manufacturing licence number;
b) Name of the bandage;
c) Size of the bandage;
d) Date of manufacture and batch number, and
e) If the cloth is dyed, the name of the colour should be stated on the label; and
f) If the adhesive is made porous, it shall be stated on the label.
g) Any other statutory requirement as required by the law in force or as agreed between buyer and seller.

10.2 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 the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

ANNEX A
(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
IS 196 : 1966	Atmospheric conditions for testing (*revised*)
IS 264 : 2005	Nitric acid - Specification (*third revision*)
IS 460 (Part 1) : 2020	Test Sieves — Specification Part 1 Wire Cloth Test Sieves (*fourth revision*)
IS 832	Textiles determination of twist in yarns
(Part 1) : 2021	Direct counting method
(Part 2) : 2011	Untwist retwist method for single spun yarns (*second revision*)
IS 1390 : 2022	Textiles — Determination of pH of aqueous extract (third revision)
IS 1963 : 1981	Methods for determination of threads per unit length in woven fabrics (*second revision*)
IS 4905 : 2015	Random sampling and randomization procedures (*first revision*)
IS 14944 : 2020	Surgical dressings — Methods of test (*first revision*)

ANNEX B
(*Clause* 5.1 and *Table* 1)

DETERMINATION OF WEIGHT OF CLOTH AND WEIGHT OF ADHESIVE MASS

B-1 TEST SPECIMEN

B-1.1 Cut about 10 g of the sample from the sample and weigh it accurately Take care to cut parallel to the warp and weft threads.

B-2 PROCEDURE

B-2.1 Measure the area of the specimen accurately and extract with chloroform in a Soxhlet extractor until the adhesive mass completely disintegrates. Take out the fabric, dry to remove residual chloroform and immerse in dilute acetic acid for 3 hrs. Remove sample in a suitable vessel and wash 12 times with boiling water, using 1 000 ml for each washing. Pass wash water through 150 micron IS Sieve [*see* IS 460 (Part 1)] to collect any loose fibres. Dry the residue to constant weight at 100 ± 2°C and correct the weight for moisture regain.

B-2.2 Calculate the weight of fabric in g/m2. Calculate weight of the adhesive mass in g/m2 by subtracting the weight of the fabric from the weight of sample originally taken as given below:

$$\text{Weight of adhesive mass} = \frac{W-w}{A} \text{ g/m}^2$$

Where

W = weight in grams of the sample taken,

w = weight in grams of the residual fabric corrected by moisture regain, and

A = area in square metre of the sample taken.

Correction for moisture regain = 8.53 percent.

ANNEX C
(*Clause* 5.2)

METHOD FOR DETERMINATION OF ZINC OXIDE CONTENT

C-1 REAGENTS

C-1.1 Nitric Acid — (*see* IS 264).

C-1.2 Dilute Ammonium Hydroxide — approximately 6N.

C-1.3 pH 10 Buffer — Dissolve 68 g of ammonium chloride in 200 ml of water, add 570 ml of concentrated ammonia, and dilute to one litre.

C-1.4 Eriochrome Black T Indicator — Dissolve 0.5 g of the dye and 5 g of hydroxylamine hydrochloride in 100 ml of alcohol.

C-1.5 Standard EDTA Solution — Dry ethylenediamine tetra-acetate dihydrate disodium salt (EDTA) at 80°C and a relative humidity of 50 percent (25°C) for a period of 2 to 3 days to give a product approaching 100 percent in assay. Dissolve about 5 g of EDTA in 500 to 800 ml of water in a 1 000 ml volumetric flask. When solution is complete, dilute to the mark and mix thoroughly. Transfer the solution to a polyethylene bottle. This solution is approximately 0.01 M. Standardize this solution with standard calcium chloride solution. Calculate the exact strength of EDTA solution and adjust the strength of the concentrated EDTA solution to exactly 0.01 M. Carry out the operations as in **C-1.5.1** and **C-1.5.2**.

C-1.5.1 *Using GBHA* — Transfer 25 ml of the standard calcium solution to a 250-ml Orlonmeyer flask. Add about 25 ml of water. Add by means of graduated pipettes, 4 ml of 2N sodium hydroxide solution, 15 ml of ethanol and 1 ml of GBHA indicator solution. Stand for about 2 minutes. Titrate with EDTA until colour turns from red to pure yellow.

C-1.5.2 Prepare colour comparison blanks in all the above cases by successively transferring to 250 ml conical flask approximately the same amount of water, the reagents, the indicator and sufficient EDTA to produce an unchanging colour.

C-2 PROCEDURE

C-2.1 Cut from the sample under test, two specimens weighing one gram each taking as much care as possible to cut parallel to the warp and weft threads. Take one specimen and find the weight of adhesive mass as in Appendix A. Heat the second specimen with 10 ml of nitric acid in a round bottom flask until the plaster disintegrates. Boil it for 10 to 15 minutes on a low flame. Cool and dilute with 10 to 15 ml of water. Neutralize using dilute ammonia solution. Add 20 ml of pH 10 buffer and two drops of eriochrome black T indicator to obtain a clear visible red colouration in the solution. Titrate it with EDTA solution until the colour changes from red to blue.

C-3 CALCULATION

C-3.1 Zinc oxide (as ZnO), percent by weight = $0.081\ 38 \times \frac{V}{W}$

where

V = volume in ml of 0.01 M EDTA solution used for titration, and
W = weight in grams of the adhesive mass.

ANNEX D
(*Clauses* 6.1.1 and 6.1.2)

METHOD FOR DETERMINATION OF STRETCHABILITY AND RECOVERY

D-1 PREPARATION OF TEST SPECIMEN

D-1.1 Cut three test strips of a length of 30 cm from the bandage. Mark two parallel lines across the piece at a distance of 20 cm from each other, starting at a distance of 5 cm from one end.

D-2 PROCEDURE

D-2.1 Stretchability — Fix one end of the material in a fixed grip and other in a movable grip in such a way that the gauge marks are visible between the grips and the material can stretch longitudinally (crepe yarn way). Suspend a load of 1 kg/cm width on the movable grip (weight of movable grip shall be taken into account) for a period of one minute and determine the stretched length between the marks. Express the increase in length as percentage of the unstretched length of the sample.

D-2.2 Recovery — Keep the fabric under tension of 1 kgf/cm width for one minute as given in **C-2.1**. Remove the fabric from grips and lay on a smooth flat surface without any tension. After 5 min, measure the distance between the two marks.

ANNEX E
(*Clause* 9.1)

SAMPLING AND CRITERIA FOR CONFORMITY FOR ZINC OXIDE ADHESIVE PLASTER

E-1 Lot

E-1.1 In any consignment, all spools of zinc oxide adhesive plaster of similar size produced under similar conditions shall constitute a lot.

E-l.2 The number of spools to be selected from each lot shall depend upon the size of the lot and shall be in accordance with column 1 and 2 of Table 2.

Table 2 Sample Size and Criteria for Conformity
(*Clause* E-1.2)

Lot Size (1)	Sample Size (2)	Acceptance Number (3)
Up to 300	13	1
301 to 500	13	1
501 to 1 000	20	2
1 001 to 3 000	32	3
3 001 to 10 000	32	3
10 001 to 35 000	50	5
35 001 and above	80	7

E-1.2.1 These spools shall be selected from the lot at random and in order to ensure the randomness of selection, procedures given in IS 4905 shall be adopted.

E-2 NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

E-2.1 The number of spools selected at random in accordance with column 2 of Table 2 shall be tested for dimensions **(4.1)**. The lot shall be considered as conforming to this requirement if the number of defectives found in the sample is less than or equal to the corresponding acceptance number of defectives as given in column 3 of Table 2.

E-2.2 If the lot is conforming to the requirements as mentioned in **E-2.1** the test for weight of adhesive mass **(5.1)**, zinc oxide content **(5.2)**, tensile strength of plaster **(6.1)**, adhesive property **(6.2)**, pH test **(6.3)** and conditioning **(7.2)** shall be carried out. The number of times each test to be repeated shall be in accordance with col 1 and 2 of Table 3. If the sample passes each number of times, the lot shall be considered as conforming to these tests.

E-2.3 The lot shall be considered as conforming to the standard if **E-2.1** and **E-2.2** are satisfied.

Table 3 For Manufacture, Performance Requirements and Conditioning Tests
(*Clause* E-2.2)

Lot Size (1)	Number of Times Tests to be Repeated (2)
Up to 500	1
501 to 1 000	2
1 001 to 3 000	3
3 001 to 10 000	4
10 001 and above	5

FORMAT FOR SENDING COMMENTS ON BIS DOCUMENTS

(Please use A4 size sheet of paper only and type within fields indicated. Comments on each clause/sub clause/table/fig etc. be started on a fresh box. Information in column 3 should include reasons for the comments and suggestions for modified working of the clauses when the existing text is found not acceptable. Adherence to this format facilitates Secretariat's work)

Please e-mail your comments to textiles.bis@gmail.com or txd@bis.gov.in or faxed on 011-23231282.

NAME OF THE COMMENTATOR/ORGANIZATION:

DOCUMENT NO:

Item, Clause Sub-Clause No. Commented upon (Use Separate Box afresh)	**Comments**	**Specific Proposal (Draft clause to be add/amended)**	**Remarks**	**Technical References and justification on which (2), (3), (4) are based**
(1)	**(2)**	**(3)**	**(4)**	**(5)**

भारतीय मानक ब्यूरो

भारतीय मानक मसौदा

चिकित्सीय वस्त्रादि — निलंबन पट्टियां — विशिष्टि

(आई एस 9751 का *पहला पुनरीक्षण*)

BUREAU OF INDIAN STANDARDS

Draft *Indian Standard*

MEDICAL TEXTILES — BANDAGE, SUSPENSORY — SPECIFICATION

(*first revision of* IS 9751)

ICS 11.040.30; 59.080.99

Last date for receipt of comment is 23 February 2023

FOREWORD

(*Formal clause will be added later*)

This standard was first published in 1981. This revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

a) Amendment 1 has been incorporated.
b) The material requirements have been modified.
c) Reference to Indian standards have been updated;
d) BIS certification marking clause has been updated;
e) Sampling and criteria of conformity has been specified; and
f) Marking and packing clauses have been modified.

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 : 2022 'Rules for rounding off numerical values (*second 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.

1 SCOPE

This standard cover constructional and other requirements for suspensory bandage.

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 MATERIAL REQUIREMENT

3.1 The body of the bandage shall be made from good quality white cotton drill conforming to variety no. 1 of IS 177.

3.2 Pouch shall be made from knitted fabric of soft spun 29.5 tex (20's) hosiery yarn. The yarn shall have minimum average lea strength of 270 N when tested as per method given in IS 1671.The fabric weight shall be minimum 153 g/m^2 when tested as per the method given in IS 1964. The pouch shall have the following constructional structure:

Wales per 5 cm	— 50
Courses per 5 cm	— 60
Holes per cm	— 12

3.3 Sewing Thread — The sewing thread used for bandage shall have nominal count of 100 dtex x 6 (or 60's × 6) conforming to variety no. 31 of IS 1720.

3.4 Buckle — The buckle shall have nominal size of 21 mm conforming to Table 8 of IS 4274.

3.5 Tape Newar — The tape newar shall be of 25 mm width, undyed (bleached) conforming to table 1 of IS 1895.

3.6 Tape Elastic — The elastic tape shall have length 22 ± 2 mm and width 5 ± 1 mm conforming to IS 9686.

4 WORKMANSHIP AND FINISH

4.1 All sewing shall be done with lock stitches by turning in the free ends to depth as shown in Fig. 2.

4.2 The bandage shall be tailored neatly out of the cotton drill, knitted cloth and tape. The wales shall run along the length of the pouch.

4.3 The bandage shall fit with the anatomy and give proper support to scrotum.

4.4 The bandage shall be surgically clean, namely, resemble a freshly laundered unused cloth.

4.5 The bandage after sewing process needs to be ensured as free from any foreign matters like needles or any other sewing parts, etc.

5 GENERAL REQUIREMENT

5.1 Shape and Dimensions — As given below and shown in Fig. 1, 2 and 3.

Sl No	Dimension	All dimensions in mm		
		A	B	C
i)	Adults (Large)	220	200	120
ii)	Adults (Small)	165	150	90
iii)	Infants and Children	110	100	60

5.2 The bandage shall have the pH value (aqueous extract) between 6.5 to 8.5 when determined as per method given in IS 1390.

6 Marking

6.1 A cloth label of suitable size shall be securely stitched to each bandage indicating the following:

a) Manufacturer's name, initials or registered trade-mark, if any;
b) Lot No./Batch No.;
c) Month and year of manufacture;
d) Size/dimension of the bandage indicated as:

    infants and children,
    adults — small, and
    adults — large.

e) Any other statutory requirement as required by the law in force or as agreed between buyer and seller.

6.2 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 the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product may be marked with the Standard Mark.

7 SAMPLING AND CRITERIA OF CONFORMITY

7.1 Lot — The quantity of suspensory bandage delivered to one buyer against one dispatch note shall constitute a lot.

7.2 The conformity of a lot to the requirements of the standard shall be determined on the basis of the tests carried out on the sample selected from the lot.

7.3 Unless otherwise agreed to between the buyer and the seller, the number of pieces to be selected at random shall be in accordance with column 2 and 3 of Table 2 to ensure the randomness of IS 4905 may be used.

Table 2 Sample Size and Criteria for Conformity
(*Clause* 7.3)

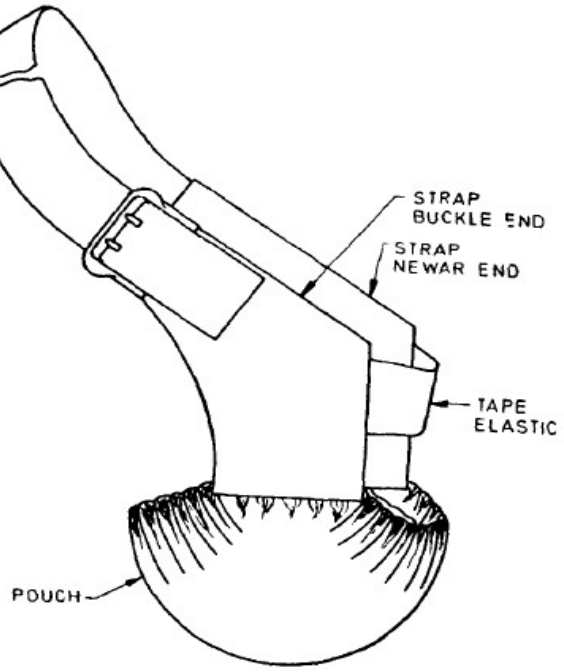
Sl No.	Lot Size	Sample Size	Permissible Number of Non-Conforming Suspensory Bandage	Sub-sample Size
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	5	0	2
ii)	51 to 150	8	0	3
iii)	151 to 300	13	1	3
iv)	301 to 500	20	1	5
v)	501 and above	32	2	5

7.4 Number of Tests and Criteria for Conformity

Characteristics	Number of Tests	Criteria for Conformity
Dimension, workmanship and finish	According to column 3 of Table 2	Permissible number of non-conforming pieces not to exceed the corresponding number given in co1umn 4 of Table 2
pH value	According to column 5 of table 2	All the test pieces shall meet the requirements

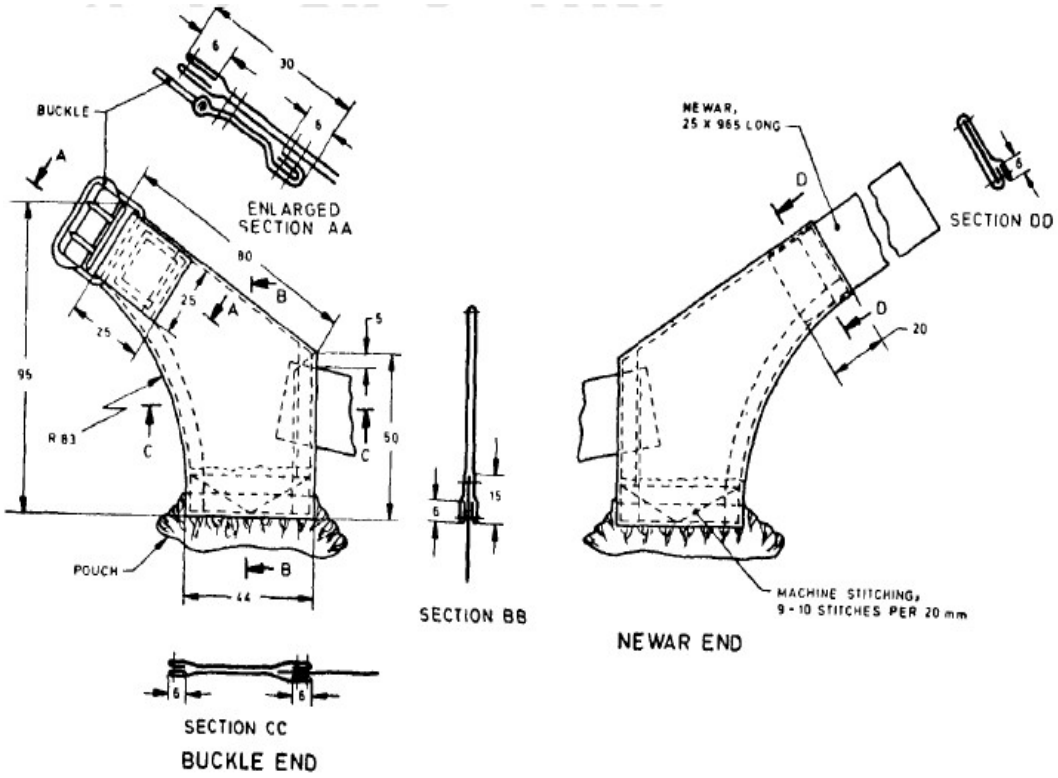
8 PACKING

The bandage shall be so packed that dust and other particulate contamination does not reach the bandage inside the packing. The bandage shall be packed securely so as to allow normal handling and transport without tearing and exposing the contents. Details of the packing shall be as agreed to between the buyer and the seller. Packaging of the product shall be such as to maintain the integrity of the product throughout its shelf life.



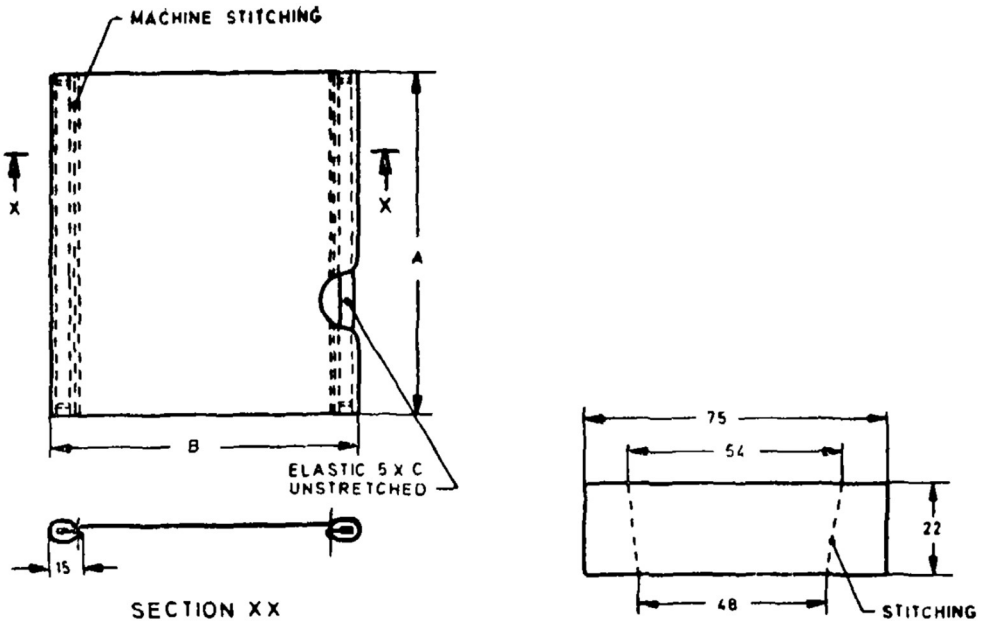
All dimensions in millimetres

FIG. 1 SUSPENSORY BANDAGE



All dimensions in millimetres

FIG. 2 DETAILS OF STRAPS



All dimensions millimetres

FIG. 3 DETAILS OF POUCH AND TAPE ELASTIC

ANNEX A
(*Clause* 2)

IS No.	*Title*
IS 177 : 1989	Cotton drills – Specification (*fourth revision*)
IS 1390 : 2022/ISO 1390 : 2020	Textiles — Determination of pH of aqueous extract (*third revision*)
IS 1671 : 1977	Method for determination of yarn strength parameters of yarns spun on cotton system (*first revision*)
IS 1720 : 1978	Specification for cotton sewing threads (*first revision*)
IS 1895 : 1982	Specification for cotton NEWAR (*second revision*)
IS 1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*)
IS 4274 : 1981	Specification for buckles (*first revision*)
IS 4905 : 2015	Random sampling and randomization procedures (first revision)
IS 9686 : 1980	Specification for elastic tape

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भारतीय मानक ब्यूरो

भारतीय मानक मसौदा

चिकित्सीय वस्त्रादि – अस्पताल ग्रे फ्लैनेल – विशिष्टि (आई एस 674 का चौथा पुनरीक्षण)

BUREAU OF INDIAN STANDARDS

Draft *Indian Standard*

MEDICAL TEXTILES — HOSPITAL GREY FLANNEL — SPECIFICATION

(*fourth revision* of IS 674)

ICS 11.040.30; 59.080.99

Last date for receipt of comment is 17 February 2023

FOREWORD

(*Formal clause will be added later*)

The second and third revisions of this standard were published in 1973 and 1987. In the present revision, the following major changes have been made:

a) References to Indian standards have been updated;
b) BIS certification marking clause has been updated.
c) Marking and packing clauses have been updated.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final values, observed or calculated, expressing the results of tests, 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 values should be the same as that of the specified values in this standard.

1 SCOPE

1.1 This standard prescribes the constructional particulars and other requirements of hospital grey flannel.

1.2 This standard does not specify the indeterminable characteristics like general appearance, feel, finish and shade of cloth (*see* also **5**).

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 TERMINOLOGY

For the purpose of this standard, the following definitions along with those given in IS 11206 shall apply.

3.1 Virgin Wool — Pure and new wool. It means wool that has not been processed or used before and is thus distinctly different from reprocessed or reused wool.

3.2 Woollen Spun — A term applied to staple yarn produced by carding, condensing and spinning on machinery originally designed for processing of wool into yarn. Such yarns may be from wool, its blends or even non-wool.

4 MANUFACTURE

4.1 Yarn used in the manufacture of the cloth shall be spun from virgin wool in the woollen system. Polyamide or polyester fibres may be used in the admixture to indigenous wool to the extent of 10 to 15 percent, if agreed to between the buyer and the seller.

4.2 The particulars regarding the grade of wool, count of yarn, weave and finish for the manufacture of cloth are given in Table 1.

Table 1 Manufacturing Particulars of Hospital Grey Flannel
(*Clause* 4.2)

Sl No.	**Fineness Grade of Wool (*see* Note 2)**	**Approximate Count of Yarn [Universal count (metric count)]**		**Weave**	**Method of Dyeing**	**Type of Finish**
		Warp	Weft			
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	60^s	100 tex (Nm 10)	100 tex (Nm 10)	Plain	Stock Dyeing	Flannel Finish
NOTES						

1	Polyamide or polyester fibres dyed to the requisite shade may be used in admixture to indigenous wool fibres to the extent of 10 to 15 percent, if agreed to between the buyer and the seller.
2	For determination of fineness grades of wool, a reference may be made to IS 5910.

4.3 Cloth — The cloth shall be clean, scoured and free from grease, soap filling or any other admixture which might give fictitious weight, substance or firmness.

4.3.1 The cloth shall be uniformly woven with firm selvedges.

4.3.2 In case the cloth is to be mothproofed, the same shall be rendered mothproof by suitable mothproofing chemicals which will not have any toxic effect on human body and the manufacturer should declare by which chemical the mothproofing has been done and minimum residual percentage of mothproofing chemical in the fabric, and the suitable method of test for determining the same.

NOTE — The active constituents of some of the commonly used mothproofing chemicals are as follows:

a) Chloro-2-chloromethll sulphonamide diphenyl ether derivatives (CCSD);
b) Halogenated diphenyl urea derivative; and
c) 2-trifluromethyl-4-(2, 4, 5- trichlorophenoxy)-5, 7-dichlorobenzimidazol.

4.3.3 The cloth, when visually examined against light and on a surface, shall not have more than 12 objectionable flaws in a full-length piece (*see* IS 14466). However, in 25 percent of the pieces in the lot, up to a maximum of 16 objectionable flaws per piece may be permitted. The objectionable flaws shall be those which strike immediately the eyes of the person examining the cloth and shall be deemed to include:

a) Missing ends and picks;
b) Floats;
c) Cuts and holes;
d) Stains;
e) Weft bars and warp section marks;
f) Big slubs, knots and specks;
g) Prominently noticeable thick and thin places; and
h) Dyeing defects (streaks, patches).

4.3.3.1 All objectionable flaws shall be marked by means of a thread of a contrasting shade sewn in the selvedge opposite the flaw. An allowance of 10 cm shall be given for each flaw up to 12 flaws in the piece. However, in case of pieces having flaws exceeding 12 and up to 16, an allowance of 25 cm for each such flaw shall be given.

5 REQUIREMENTS

5.1 The constructional particulars of the cloth shall conform to those given in Table 2.

Table 2 Constructional Particulars of Hospital Grey Flannel
(*Clause* 5.1)

Sl No.	Ends/ Dm	Picks/ Dm	Mass	Breaking Strength in 15 ×20 cm Ravelled Strips, *Min*		Length (*See* Note)	Width (Exclusive of Selvedges), *Min*
				Warp	Weft		
(1)	(2)	(3)	(4) g/m^2	(5) N	(6) N	(7) m	(8) cm
i)	140	125	255	635	590	36 and above	140
Tolerance, percent	±5	±5	±5	—	—	—	—
Method of Test	IS 1963	IS 1963	IS 1964 (Method A)	**Annex B**		IS 1954	IS 1954
NOTE—The number of short length pieces (measuring not less than 10 m) shall not exceed 5 percent of the total number of pieces in the lot.							

5.2 The other requirements of flannel shall conform to those given in Table 3.

6 SEALED SAMPLE

6.1 If, in order to illustrate or specify the general appearance, feel, shade and finish, etc, of cloth, a sample has been agreed upon and sealed, the supply shall be in conformity with the sample in such respects.

6.1.1 The custody of the sealed sample shall be a matter of prior agreement between the buyer and the seller, and the sealed sample would be replaced at regular interval for avoiding any change in shade, feel and finish.

Table 3 Requirements of Hospital Grey Flannel

(*Clause* 5.2)

Sl. No.	Characteristic	Requirement	Method of Test
(1)	(2)	(3)	(4)
i)	Relaxation shrinkage. percent, *Max*: a) Warpway b) Weftway	 5.0 4.0	IS 665
ii)	Colour fastness to:		
	a) Light (*see* Note)	4 or better	IS/ISO 105-B01 or IS/ISO 105-B02
	Washing:		IS/ISO 105-C10

	1) Change in colour 2) Staining on wool	4 or better 4 or better	
	c) Dry cleaning (vapour phase cleaning): 1) Change in colour 2) Staining of the solvent	 4 or better 4 or better	IS/ISO 105-D01
iii)	Wool content percent, *Min* (All wool flannel)	99	IS 8476
iv)	Blend, percent (Blended flannel)	*See* Note in Table 1	IS 2006
NOTE — In case of dispute, colour fastness to light shall be determined by the method prescribed in IS/ISO 105-B01			

7 MARKING

7.1 The cloth shall be marked with the following:

a) Name of the material;
b) The legends 'All Wool' or 'Blended Wool'. In the latter case the percentage of wool and other fibres be also indicated;
c) Manufacturer's name, initials or trade-mark;
d) Month and year of manufacture; and
e) Length and width of the piece.
f) Any other requirement as agreed between buyer and seller or required as per law in force.

7.1.1 *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 the *Bureau of Indian Standards Act*, 2016 and the Rules and Regulations framed thereunder, and the product may be marked with the Standard Mark.

8 PACKING

8.1 The cloth shall be packed in bales or cases in conformity with the procedure specified either in IS 32 or in IS 741, as required.

8.2 Alternatively, the cloth may be packed according to details given below, when specifically agreed to between the buyer and the seller:

Each piece of cloth shall be suitably folded in a rectangular form or wrapped on cardboard or strawboard of suitable size and thickness. Each piece shall then be wrapped with polyethylene film

of minimum 40-micron thickness or alternatively kraft paper. The edges of the kraft paper or polyethylene film shall be gummed or sealed. Alternatively, each piece may be tied with a twine at least at two places. Such, pieces, in a suitable number, shall then be enclosed in an outer layer of heavy tee jute cloth preferably conforming to IS 3751 to form compact bales. The bales shall be made secure by cross hooping the steel strips at right angles to both the length and the width of the bale. The gross mass of the bale shall not normally exceed 12 kg.

9 SAMPLING

9.1 Lot — The quantity of cloth delivered to one buyer against one dispatch note shall constitute a lot.

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

9.3 Unless otherwise agreed to between the buyer and the seller, the number of pieces to be selected at random shall be in accordance with col 2 and 3 of Table 4 to ensure the randomness of IS 4905 may be used.

Table 4 Sample Size and Criteria for Conformity
(*Clause* 9.3)

Sl No.	Lot Size	Sample Size	Permissible Number of Non-conforming Pieces	Sub-sample Size
(1)	(2)	(3)	(4)	(5)
i)	Up to 50	5	0	2
ii)	51 to 150	8	0	3
iii)	151 to 300	13	1	3
iv)	301 to 500	20	1	5
v)	501 and above	32	2	5

9.4 Number of Tests and Criteria for Conformity

Characteristics	Number of Tests	Criteria for Conformity
Ends, picks, mass, width and visual defects	According to col 3 of Table 4	Permissible number of non-conforming pieces not to exceed the corresponding number given in co1 4 of Table 4
Length	-do-	Length of each piece not to measure less than the specified, declared or marked length
Breaking strength	According to co1 5 of Table 4	$\bar{X} - 0.4\ R \geq$ specified value

Relaxation shrinkage	-do-	$\bar{X}$ + 0.4 R ≤ specified value
Colour fastness	-do-	All the test specimens satisfy the relevant requirements
Wool content blend, percent	-do-	-do-
Where $\bar{X}$= Average value obtained by dividing the sum of the observed values by the number of test results. R = Range, that is difference between the maximum and minimum in a set of observed values.		

ANNEX A

(*Clause* 2)

LIST OF REFERRED INDIAN STANDARDS

IS No.	*Title*
IS 32 : 1971	Code for seaworthy packaging of woollen and worsted yarn and cloth (*second revision*)
IS 665 : 1989	Textiles — Determination of dimensional changes of fabrics containing wool on soaking in water (*first revision*)
IS 741 : 1971	Code for inland packaging of woollen and worsted yarn and cloth (*first revision*)
IS 1954 : 1990	Determination of length and width of woven fabrics — Methods (*second revision*)
IS 1963 : 1981	Methods for determination of threads per unit length in woven fabrics (*second revision*)
IS 1964 : 2001	Textiles — Methods for determination of mass per unit length and mass per unit area of fabrics (*second revision*)
IS 1969 (Part 1) : 2018	Textiles — Tensile Properties of Fabrics Part 1 Determination of Maximum force and Elongation at Maximum Force Using the Strip Method (*fourth revision*)
IS 2006 : 1988	Method for quantitative chemical analysis of binary mixtures of protein fibre with certain other non-protein fibres (*second revision*)
IS 5910 : 1977	Fineness grades of wool (*first revision*)
IS 6359 : 1971	Method for conditioning of textiles
IS 8476 : 1977	Method for determination of wool content in woollen textile materials

IS 11206 : 1984	Glossary of textile terms - Wool and other animal fibres, their processing and products
IS 14466 : 1997/ISO 8498 : 1990	Fabrics — Description of Defects — Vocabulary
IS/ISO 105-B01 : 2014	Textiles — Tests for colour fastness Part B01 Colour fastness to light: Daylight
IS/ISO 105-B02 : 2014	Textiles — Tests for colour fastness Part B02 Colour fastness to artificial light: Xenon arc fading lamp test
IS/ISO 105-C10 : 2006	Textiles — Tests for colour fastness Part C10 Colour fastness to washing with soap or soap and soda
IS/ISO 105-D01 : 2010	Textiles — Tests for colour fastness Part D01 Colour fastness to drycleaning using perchloroethylene solvent

ANNEX B

(*Clause* 5.1 and Table 2)

METHOD FOR DETERMINATION OF BREAKING STRENGTH

B-1 CONDITIONING

B-1.1 Prior to test, the test specimens shall be conditioned for at least 24 hrs in a standard atmosphere at 65 ± 2 percent relative humidity and 27 ± 2°C temperature (*see* IS 6359).

B-1.2 The tests shall also be carried out in a standard atmosphere (*see* **B-1.1**)

B-2 PREPARATION OF THE RAVELLED STRIP TEST SPECIMEN

B-2.1 For the purpose or this test, the test specimens of size 300 mm lengthwise and 200 mm widthwise shall be cut in both warpway and weftway directions from each of the sample pieces as selected in column 4 of Table 4. The preparation of the ravelled strip test specimen of size 150 × 200 mm and their number shall be according to IS 1969.

B-3 TESTING APPARATUS

B-3.1 The requirements of tensile strength testing machine used for determining the breaking load of the test specimens shall be according to IS 1969.

B-4 JAW FACES AND MOUNTING OF THE TEST SPECIMEN

B-4.1 The width of the jaw faces of tensile testing machine shall be at least 170 mm. The mounting of the test specimens shall be according to IS 1969.

B-5 TEST PROCEDURE

B-5.1 The test procedure shall be according to IS 1969.

B-6 CALCULATIONS AND REPORTING

B-6.1 The calculations and reporting of test results shall be done according to IS 1969.