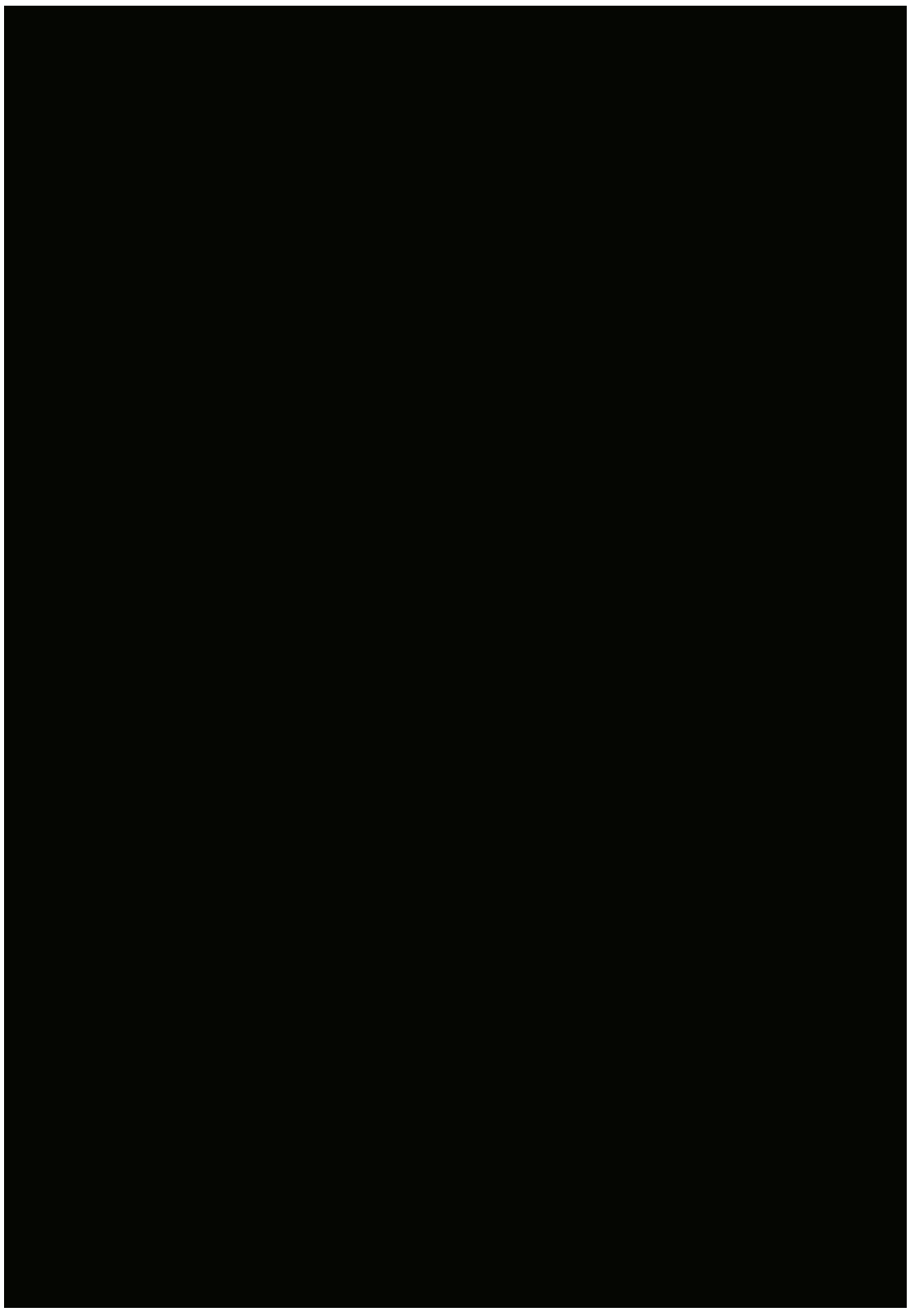

IS : 9481 - 1980

Indian Standard

SPECIFICATION FOR PILLOWS, AIR

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Indian Standard

SPECIFICATION FOR PILLOWS, AIR

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 29 April 1980, after the draft finalized by the Travel Requisites Sectional Committee had been approved by the Consumer Products and Medical Instruments Division Council.

0.2 In view of the difficulties encountered by the purchaser in selecting the proper materials, the Committee responsible for formulation of this standard agreed to stipulate the essential requirements in this specification.

0.3 Keeping in view of the availability of suitable materials, this standard permits the manufacturer to select wide range of suitable materials for base fabric, nozzle, plug and cord provided the end product satisfies the requirements laid down in this standard.

0.4 This standard contains clauses which call for agreement between the purchaser and the supplier and which permit the purchaser to use his option for selection to suit his requirements. The relevant clauses are **3.1, 6.4, 6.8, 7.1** and **9.1.**

0.5 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*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard covers the requirements and methods of tests for air pillows that are inflated with mouth and mainly used for travelling.

*Rules for rounding off numerical values (*revised*).

2. TERMINOLOGY

2.1 For the purpose of this standard, the definition of terms given in IS : 2244-1972* shall apply.

3. SHAPE AND DIMENSIONS

3.1 The air pillows shall be made to the pattern, shape and dimensions as shown in Fig. 1. Any other pattern, shape or dimension shall be subject to agreement between the purchaser and the supplier.

3.2 Dimensions given in Fig. 1 are minimum dimensions.

4. MATERIAL

4.1 Body — The body of the air pillows shall be made from fabric rubberized on one side.

4.1.1 *Base Fabric* — The base fabric shall be made of cotton or viscose staple or any suitable textile materials.

4.2 Nozzle for Inflation and Plug for Nozzle — These shall be made from rubber or from any suitable polymeric material. The nozzle and plug, if made of metal, shall be nickel plated or anodized.

4.2.1 *Cord for Tying Nozzle Plug with the Air Pillow* — Shall be made out of suitable cord made from cotton or any synthetic textile material.

4.3 Proofing — The proofing (coating) shall be made from natural rubber or suitable vulcanizable synthetic rubber or a combination thereof, compounded with necessary ingredients. The proofing shall be free from vulcanized waste, reclaimed rubber and substances liable to cause tendering of the base fabric.

4.3.1 The proofing shall be non-porous, homogeneous, non-blooming and free from objectionable odour. The minimum rubber polymer content of the proofing shall be 40 percent by mass when tested according to Appendix A of IS : 5915-1970†. The other requirements of proofing shall be as laid down in Table 1. In case the manufacturer certifies that only natural rubber has been used, the direct method for estimation of rubber hydrocarbon [according to IS : 3660 (Part I)-1972‡] may be adopted.

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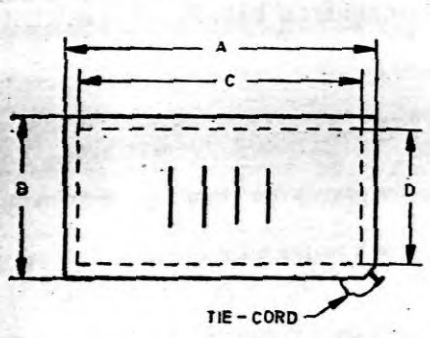
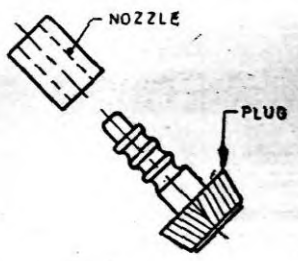
*Glossary of terms relating to treated fabrics (*first revision*).

†Specification for single texture rubberized waterproof fabrics.

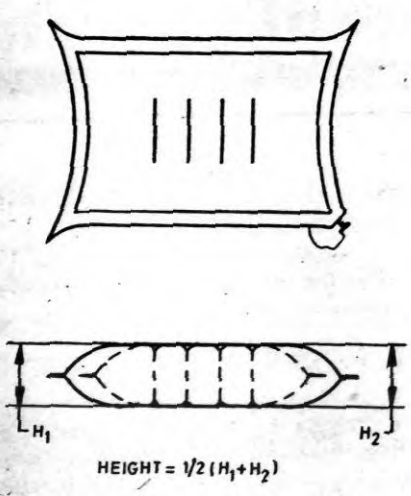
‡Method of test for natural rubber : Part I Determination of dirt, volatile matter, ash, total copper, manganese iron, rubber hydrocarbon, viscosity (shearing disc viscometer), and vulcanizing of rubber in a standard compound (*first revision*).



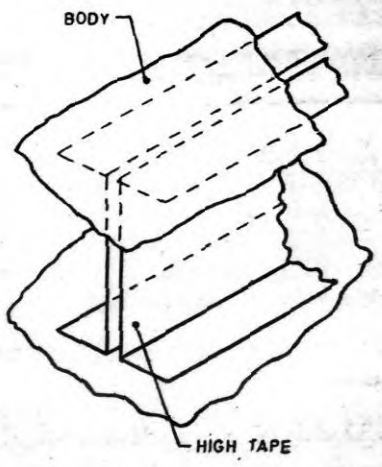
AIR PILLOW DEFLATED



ENLARGED DETAIL OF NOZZLE AND PLUG



AIR PILLOW INFLATED



ENLARGED VIEW OF HIGH TAPE

Size	*A*	*B*	*C*	*D*
1	580	340	550	300
2	450	300	420	260

All dimensions in millimetres.

FIG. 1 AIR PILLOW

TABLE 1 REQUIREMENTS OF RUBBERIZED FABRIC USED IN THE BODY OF AIR PILLOW

(*Clause* 4.3.1)

Sl No.	Characteristic	Requirement	Method of Test Referred
i)	Weight per square metre	750 g, *Max*	IS : 1964 - 1970*
ii)	Proofing content per square metre	350 g, *Min*	Appendix B
iii)	Breaking strength, 50 × 200 grip, *Min*		IS : 7016 (Part II)-1973†
	Warp	245 N (25 kgf)	
	Weft	147 N (15 kgf)	

*Method for determination of weight per square metre and weight per linear metre of fabrics (*first revision*).

†*Method of test for coated and treated fabrics: Part II Determination of breaking* strength and extension at break.

5. WORKMANSHIP AND FINISH

5.1 The single-faced rubberized fabric with the rubberized side on the inside shall form the top and bottom panel of the air pillow body.

5.2 The high tapes forming partitions shall be properly attached to either panels. The side of the panels shall be seamed to have secured joints.

5.3 The nozzle for inflating the air pillow shall be fixed at one of the corners.

5.4 The air pillows shall be properly and uniformly vulcanized.

5.5 The air pillows shall be free from defects such as coloured patches, stains, missing threads, etc.

5.6 The air pillow when inflated to 6·9 kN/m² (0·07 kgf/cm²) shall have the minimum height of 100 mm to be measured as given in Fig. 1.

6. TESTS

6.1 Autoclaving Test — Test pieces cut from the air pillow when tested, as described in Appendix A, shall not develop any signs of tackiness or brittleness and shall show no other apparent deterioration likely to impair its usefulness.

6.2 Air Leak-Proofness Test — When the air pillow is fully inflated to 6·9 kN/m² (0·07 kgf/cm²) and kept for a period of 16 hours at room temperature, it shall not show any sign of leakage.

6.3 Water Immersion Test — Inflate the air pillow to 6·9 kN/m² (0·07 kgf/cm²) and immerse in water. The trapped air on the fabric surface may be removed by a soft camel-hair brush during the test. The leakage rate shall not exceed a total of 15 bubbles in 5 minutes from not more than five different sites of the body. No leakage/air bubbles are permissible from the seams and nozzle.

6.4 Resistance to Cold — The sample from the body portion of the pillow, after an exposure of 5 hours to a temperature of -35 ± 1°C or as agreed to between the purchaser and the supplier, shall withstand a bending test around a steel pin of 6 mm diameter without cracking.

6.5 Resistance to Xylol — Test pieces about 40 × 40 mm will be immersed in xylol for 2 hours at 27 ± 2°C (mean boiling range 140°C) and gently shaken for 1 minute. The rubber coating shall not become tacky nor shall it separate from the base fabric.

6.6 Adhesion Test — The adhesion between fabric and rubber of the body portion, shall be such that when tested in accordance with the Method B of IS : 3400 (Part V)-1965*, the rate of separation does not exceed 25 mm per minute under a load of 14·7 N (1·5 kgf) for a test piece of width 2·5 cm.

6.7 Bursting Pressure — The bursting pressure of the air pillow shall not be less than 24·5 kN/m² (0·255 kg/cm²). The failure may occur from the high tapes forming the compartments, the side seam or from the main body panel itself.

6.8 Colour Fastness to Light — The fabric, when tested for colour fastness to light as described in IS : 2454-1967† shall show a fastness rating of not less than No. 2 prescribed therein. In case of air pillows made in different shades on either sides, the test shall be conducted with respect to the fabric used in each side of the air pillow. The purchaser shall specify his option for this test.

6.9 Colour Fastness to Washing — When the fabric is tested for colour fastness to washing in accordance with IS : 764-1966‡, the fastness

*Methods of test for vulcanized rubber: Part V Adhesion of rubber to textile fabrics.

†Method for determination of colour fastness of textile materials to artificial light (xenon lamp).

‡Method for determination of colour fastness of textile materials to washing, Test 3 (*first revision*).

rating, in respect of change in shade of the material and the degree of staining of the attached undyed pieces of cotton, evaluated according to IS : 768-1956* and IS : 769-1956† respectively shall be not less than 3.

7. SAMPLING

7.1 Unless otherwise agreed to between the purchaser and the supplier, the procedure given in IS : 2500 (Part I)-1973‡ shall be followed for sampling.

7.2 The scale of sampling shall be in accordance with that specified in Table 2.

TABLE 2 SCALE OF SAMPLING

No. of Air Pillows in the Lot	Main Sample Size	Sub-sample Size
(1)	(2)	(3)
Up to 500	3	2
501 to 1 000	5	2
1 001 and above	8	3

7.3 The main samples of air pillows selected according to col 2 of Table 2, shall be examined for shape and design requirements as given in **3** and for air-proofness (*see* **6.2**) and water immersion test (*see* **6.3**).

7.4 If the main samples are found to be satisfactory the sub-samples as specified in col 3 of Table 2 shall be drawn and tested for resistance to xylol, resistance to autoclaving, adhesion, colour fastness to washing, bursting pressure, height of pillow on inflation and rubber hydrocarbon content.

7.5 If so desired by the purchaser, the sub-sample shall also be tested for resistance to cold and colour fastness to light.

7.6 The lot shall be declared conforming to the requirements of this specification if all the tests are satisfied.

*Method for evaluating change in colour.

†Method of evaluating staining.

‡Sampling inspection table: Part I Inspection by attributes and by count of defects (*first revision*).

8. MARKING

8.1 The pillows shall be indelibly and legibly marked with the following details:

a) Size, number or length and breadth of pillows, air in mm; and

b) Manufacturer's name or registered trade-mark.

8.2 The pillows may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9. PACKING

9.1 The inner side of pillows shall be dusted with French chalk and packed in wooden boxes or as agreed to between the purchaser and the supplier.

APPENDIX A

(Clause 6.1)

METHOD FOR AUTOCLAVING TEST

A-1. TEST SPECIMENS

A-1.1 Each test piece shall not measure less than 100 × 50 mm.

A-2. APPARATUS

A-2.1 The apparatus shall consist of an autoclave containing steam at 108 kN/m² (1·1 kgf/cm²) gauge pressure.

A-3. PROCEDURE

A-3.1 Keep the test pieces inside the autoclave for 20 minutes, then remove the test pieces from the autoclave and allow them to cool to room temperature. Repeat this test after a period of 2 hours, then remove the test pieces from the autoclave and allow them to cool to room temperature and dry in air. Examine the test pieces for any sign of softening, tackiness, brittleness or loss of other rubber like properties of the coating.