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Indian Standard

SPECIFICATION FOR SPECIAL PROOFED PAULINS (TARPAULINS)

(First Revision)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR SPECIAL PROOFED PAULINS (TARPAULINS)

(First Revision)

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Indian Standard

SPECIFICATION FOR SPECIAL PROOFED PAULINS (TARPAULINS)

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 18 September 1972, after the draft finalized by the Treated Fabrics Sectional Committee had been approved by the Chemical Division Council, Mechanical Engineering Division Council and Textile Division Council.

0.2 This standard was originally published in 1964 and an amendment was issued thereafter to remove ambiguity associated with certain clauses. In this revision, taking into consideration the recent developments in the field, requirements for materials, special proofing, constructional details and sampling scheme have been modified.

0.3 This standard contains clauses **3.1.3, 3.2.1, 3.2.2, 3.2.4, 3.2.6** and **5.2** which call for agreement between the purchaser and the supplier.

0.4 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 prescribes the requirements and methods of sampling and test for special proofed paulins (tarpaulins).

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 2244-1965† shall apply.

*Rules for rounding off numerical values (*revised*).
†Glossary of terms related to treated fabrics.

3. REQUIREMENTS

3.1 Materials

3.1.1 Special proofed paulins shall be made from special proofed canvas or duck conforming to IS : 6803-1972* and employing materials specified in **3.1.2** to **3.1.5.**

3.1.2 *Rope Lashing* — Sisal (aloe fibre) or hemp rope (conforming to IS : 5176-1969†) lashings of 12 mm diameter and made from 3 strands for paulins of sizes 5·5 m^2 and above, and of 8 mm diameter for sizes below 5·5 m^2 shall be used. The length of splicing shall be about 75 mm in case of 8 mm diameter rope and about 100 mm in case of 12 mm diameter rope with at least 3 tucks of each strand in each case.

3.1.3 *Sewing Thread* — Subject to agreement between the purchaser and the supplier, linen thread (165 tex × 3) having a minimum breaking load of 8 kg or rot-proof cotton thread (variety No. 19 or 42 of IS : 1720-1969‡) shall be used. The sewing thread shall be rot-proofed by copper naphthenate or zinc naphthenate or any other suitable agent subject to agreement between the purchaser and the supplier. In case copper naphthenate or zinc naphthenate is used, the amount of copper shall be 0·5 to 0·8 percent and zinc 0·8 to 1·0 percent respectively when determined by the method prescribed in Appendix A.

Shank length	18·26 mm
Total length	53·08 mm
Blade diameter	2·54 mm
Shank diameter	2·54 mm
Point length (butt to centre of eye)	5·59 mm

3.1.4 *Twine Whipping* — Same as **3.1.3** or ward thread of proofed fabric. Length of the whipping shall be at least 20 mm.

3.1.5 *Eyelets* — Aluminium alloy or brass eyelets (conforming to size 30 of IS : 4084-1967§) shall be used.

3.2 Manufacture

3.2.1 Special proofed paulin (tarpaulins) shall be made to the shade and dimensions as agreed to between the purchaser and the supplier.

3.2.2 *Construction* — The panels shall be flat (lap) jointed. If specially required by the purchaser, it may also be hook jointed (*see* Fig. 1 and 2).

*Specification for special proofed canvas and duck.
†Specification for hawser-laid hemp line and ropes.
‡Specification for cotton sewing threads.
§Specification for eyelets and washers.

AMENDMENT NO. 1 JANUARY 1975

TO

IS : 2789-1972 SPECIFICATION FOR SPECIAL PROOFED PAULINS (TARPAULINS)

(First Revision)

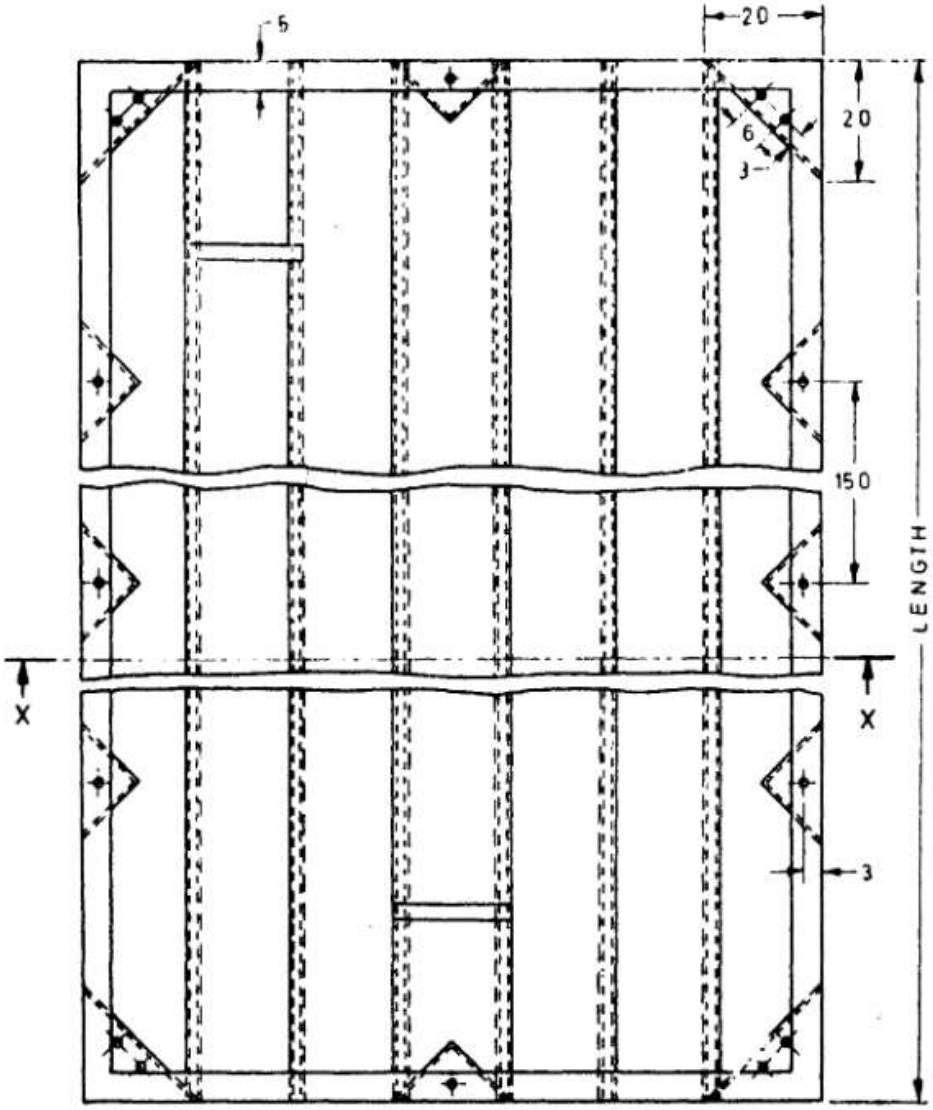
Alteration

(*Page* 4, *clause* 3.1.3, *first sentence*) — Substitute the following for the existing first sentence:

'Subject to agreement between the purchaser and the supplier, rot-proof linen thread (variety No. 1 of IS : 2196-1966 Specification for linen sewing thread for aeronautical purposes) or rot-proof cotton thread (variety No. 19 or 42 of IS : 1720-1969‡) shall be used.'

(CETDC 3)

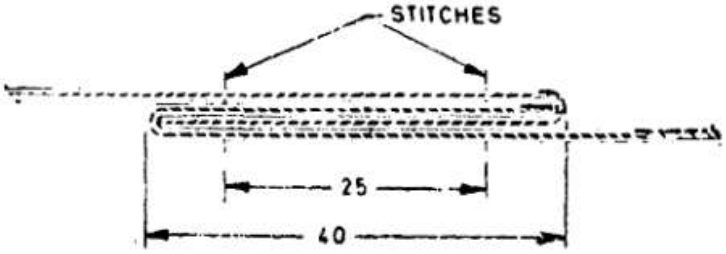
Reprography Unit, BIS, New Delhi, India



SECTION XX
(SHOWING SEAMS AND HEMS)

NOTE — For stitching, see Fig. 3.
All dimensions in centimetres.

FIG. 1 CONSTRUCTION OF SPECIAL PROOFED PAULINS (TARPAULINS)



All dimensions in millimetres.

FIG. 2 HOOK JOINED SEAMS

3.2.2.1 The ends and sides of the paulins shall be hemmed with single row of stitching. The hem shall be about 50 mm wide and the turn-in shall be in full width of the hem. The seams of the paulins shall be not less than 40 mm in width and shall be stitched by two rows of stitching 25 mm apart and approximately equidistant from the edges. In case of hook joints the turn-in at the seams shall be in full width of the joint. The panels shall be joined on either side of the centre panel such that the centre panel is laid on top and others lapped on the two sides so as to facilitate correct drainage of water in the finished paulin as shown in Fig. 1. The nine thicknesses of the fabric at each corner shall be reduced to five by cutting off a piece of fabric, 100 × 100 mm, permitting thereby the shank of the eyelets to be securely set over the washers.

3.2.2.2 Cross seams may be used at the rate of one in every third panel, and no piece less than 900 mm in length shall be used for making the panel. The cross-seam shall be made by 'fell-and-seam' method allowing for a 15 mm turn-in of the edges (Fig. 3). Narrow width panels, not less than 250 mm in width, may be used at the rate of one per paulin to obtain the required width of the paulin. In all cases, the end panels shall be of full width except where the width of the paulin is less than 2 metres, in which case one of the end panels may be less than the full width. The alternate short panels for cross-joint shall be in the opposite ends.

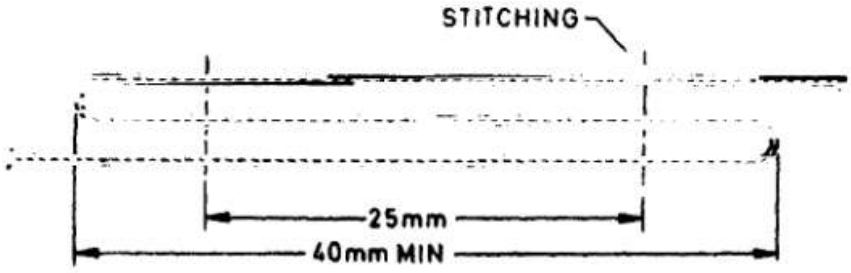


FIG. 3 FELL-AND-SEAM-METHOD

3.2.2.3 In case of hook joints of the panels on the hem, the twelve thicknesses of the base fabric at each joint which shall be reduced to six by cutting a piece of fabric 150 × 40 mm from two adjoining panels as shown in Fig. 4. In case the reinforced triangular pieces fall on the hem of the hook joints only one layer of the reinforced triangular piece shall be introduced to have only seven thickness of cloth to be stitched.

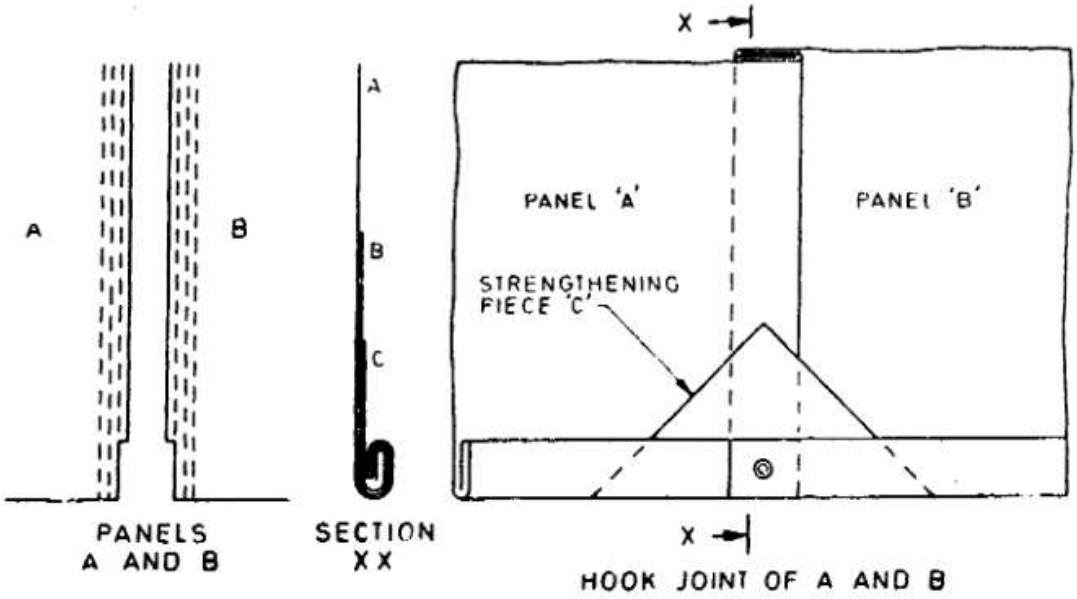


FIG. 4 REDUCTION OF THICKNESS AT HEM FOR HOOK JOINTS

3.2.3 *Fixing of Eyelets* — Unless otherwise agreed to between the purchaser and the supplier, the eyelets shall be fixed at an interval of about 1 500 mm on all sides.

3.2.3.1 The eyelets shall be fitted in a row. The holes for the eyelets shall be first punched with a small sized punch. These small holes may then be enlarged to the required size by using a marline-spike.

3.2.3.2 For all paulins above 150 square metres in size, reinforcement triangular pieces shall be provided for the eyelets. The triangular pieces (*see* Fig. 5) shall be made of 200 × 200 mm piece folded along one diagonal. Each of these triangles shall be inserted under each eyelet under the double turning, the folded edge of the strengthening piece being in line with the outer edge of the hem when finished. The triangular strengthening pieces shall be well-stitched to the special proofed paulin along all the three sides. Raw edges of triangular pieces on sides shall be turned-in by 50 mm before stitching.

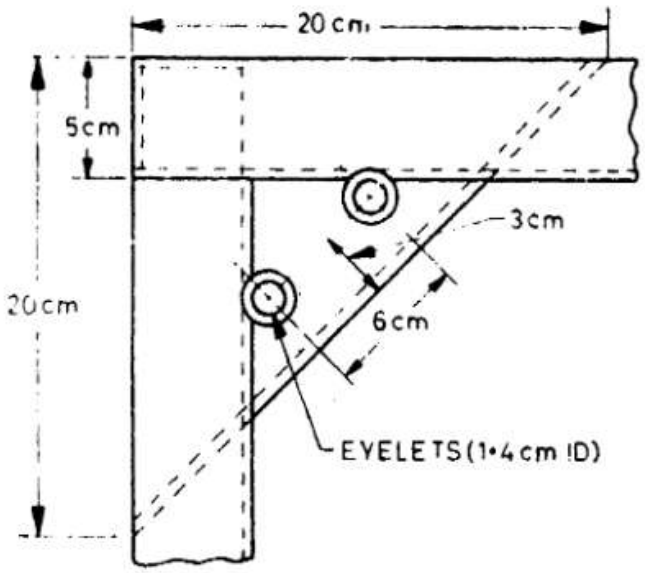


FIG. 5 TRIANGULAR STRENGTHENING PIECES

3.2.3.3 Two eyelets shall be inserted in the triangle strengthening piece in a line parallel with the diagonally folded edges at each corner of the special proofed paulin. The centres of the two eyelets shall be 60 mm apart from each other and 30 mm from the diagonally folded edge.

3.2.3.4 One eyelet shall be inserted at each eyelet portion along the sides of the special proofed paulins. The centres of these eyelets shall be at a distance of 30 mm from the outer edge of the hem.

3.2.4 The lashing ropes shall be supplied if required by the purchaser and in that case they shall be fixed to the eyelets by splicing. The number and length of the lashing ropes shall be as agreed to between the purchaser and the supplier. The free ends of the lashings shall be securely whipped with twine whipping, well-dipped in a mixture of tar and pitch, for a distance of at least 25 mm, the end being sewn at least in three places to prevent the whipping from pulling off.

3.2.5 The paulins shall be machine sewn with sewing thread, the stitching being of even tension and all loose ends being securely fastened off. The number of stitches shall be not less than two per centimetre. Sewing by hook and awl method shall not be done.

3.2.6 If specifically required by the purchaser, the seams shall be painted and malletted with the liquid proofing mixture.

3.3 The paulin shall be measured by laying it on a plain surface fully spread out. The tolerance of ± 1 percent shall be permitted, provided the average area of all the paulins in a consignment is not less than that calculated on sizes stipulated by the purchaser.

3.4 Performance Test

3.4.1 *Bag Test* — When water is slowly poured into a 200 mm high bag, formed in a frame with special proofed paulin, up to half of the depth, there shall be no leakage within one hour.

NOTE 1 — This test should not be carried out on seams of the fabric.

NOTE 2 — In case small water drops (maximum 10) are found but if these stop during the test period, such leakage should not be considered for rejection.

4. SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY

4.1 The scale of sampling and criteria for conformity of special proofed paulins shall be as prescribed in Appendix B.

5. MARKING AND PACKING

5.1 Packing — The special proofed paulins shall be packed with hessian. The four corners of the packing shall be tied to leave at least 150 mm ears for easy handling.

5.2 Marking — Each special proofed paulin shall be legibly and indelibly marked at one corner on one side with the manufacturer's name, initials or trade-mark, the year of manufacture and the size. Unless otherwise agreed to between the purchaser and the supplier, the length of the letters used for marking shall be at least 80 mm.

NOTE — For each consignment the paulins should be marked with serial number of the supply.

5.2.1 The special proofed paulin 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.

APPENDIX A

(*Clause* 3.1.3)

DETERMINATION OF COPPER AND ZINC CONTENT

A-1. PROCEDURE

A-1.1 Weigh accurately about 5 g of the sample and extract thoroughly with benzene in a Soxhlet extraction apparatus. Transfer the extract to a silica dish and evaporate by heating the dish on a water-bath. Then estimate copper and zinc content in the extracted residue after removing the solvent (benzene) and ashing the residue by applying gentle heat and then following procedure given in IS : 1039-1956* for determination of copper and zinc.

NOTE — A suitable soxhlet thimble should be used so that any solid matter detached from the fabric does not enter the extraction flask.

APPENDIX B

(*Clause* 4.1)

SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY

B-1. SAMPLING

B-1.1 Lot — All special proofed paulins in a single consignment and drawn from a single batch of manufacture shall constitute a lot. If the consignment is declared or known to consist of different batches of manufacture, the batches shall be marked separately and the group of special proofed paulins in each batch shall constitute a separate lot.

B-1.1.1 All pieces of special proof paulins shall be examined for visual and tactile requirements. Samples shall be tested from each lot for ascertaining the conformity of the special proofed paulins in the lot to the other requirements of the specification. Number of sample to be tested from a lot shall be as given in col 1 and 2 of Table 1. The sample shall be drawn at random (*see* IS : 4905-1968†) from the units in the lot.

*Methods for estimation of small quantities of copper, iron, manganese, chromium and zinc in proofed cotton fabrics (*tentative*).

†Methods of random sampling.

AMENDMENT NO. 2 APRIL 1979

TO

IS : 2789-1972 SPECIFICATION FOR SPECIAL PROOFED PAULINS (TARPAULINS)

(First Revision)

Alteration

(*Pages* 10 *and* 11, *Appendix* B) — Substitute the following for the existing appendix:

'APPENDIX B

(*Clause* 4.1)

SAMPLING OF SPECIAL PROOFED PAULINS (TARPAULINS)

B-1. SCALE OF SAMPLING

B-1.1 Lot — In a single consignment all special proofed paulins belonging to the same batch of manufacture shall constitute a lot. If the consignment is declared or known to consist of different batches of manufacture, batches shall be marked separately and the group of proofed special proofed paulins in each batch shall constitute a separate lot.

B-1.2 For ascertaining conformity of material in the lot to the requirements of the specification, samples shall be tested for each lot separately.

B-1.3 The number of pieces of paulins to be selected for this purpose shall depend on the size of the lot and shall be according to col 1 and 2 of Table 1.

TABLE 1 SCALE OF SAMPLING

No. of Pieces of Paulins in the Lot	For Non-critical Requirement		Sample Size for Critical Requirements
	Sample Size	Acceptance Number	
(1)	(2)	(3)	(4)
Up to 50	3	0	1
51 to 100	5	0	2
101 to 300	8	0	3
301 to 500	13	1	4
501 and above	20	2	5

B-1.3.1 These paulins shall be selected at random and in order to ensure the randomness of selection, a random number table shall be used. For guidance and use of random number tables, IS : 4905-1968* may be referred. In the absence of a random number table following procedure may be adopted:

Starting from any paulin in the lot, count them in one order as 1, 2, 3, ... , up to r and so on, where r is the integral part of N/n (N and n being the number of paulins in the lot and sample respectively). Every rth and paulin so counted shall be withdrawn to constitute the sample.

B-2. NUMBER OF TESTS AND CRITERIA FOR CONFORMITY

B-2.1 The number of paulins, selected according to col 1 and 2 of Table 1 shall be examined for non-critical (visual, dimensional and tactile) requirements. A paulin failing in one or more of these requirements, shall be considered as defective. The lot shall be considered to have satisfied these requirements if the number of defectives found in the sample is less than or equal to the corresponding acceptance number given in col 3 of Table 1.

B-2.2 The number of paulins as given in col 4 of Table 1 shall be tested for critical requirements (other than non-critical). These paulins may be selected from those, already tested and found satisfactory according to **B-2.1**. A paulin failing in any of these requirements shall be considered as defective. The lot shall be considered to have met these requirements if none of the paulins in the sample is found defective.

B-2.3 The lot shall be declared as conforming to the requirements of the specification if **B-2.1** and **B-2.2** are satisfied.'

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*Method of random sampling.

TABLE 1 SCALE OF SAMPLING AND PERMISSIBLE NUMBER OF DEFECTIVES

(*Clauses* B-1.1.1 *and* B-1.2.1)

LOT SIZE	NUMBER OF SAMPLES TO BE SELECTED	PERMISSIBLE NUMBER OF DEFECTIVES
N	*n*	
(1)	(2)	(3)
5 to 25	5	0
26 ,, 100	15	1
101 ,, 300	30	2
301 ,, 500	40	3
501 ,, 800	55	3
801 ,, 1 300	75	4
1 301 and above	115	6

B-1.2 Number of Tests

B-1.2.1 All the samples drawn under **B-1.1.1** shall be tested for requirements other than visual, dimensional and tactile characteristics as given under 3. If the number of special proofed paulins failing to satisfy the requirements for these characteristics is not more than the number given in col 3 of Table 1, the lot shall be declared to have satisfied the requirements for these characteristics. If, however, the number of paulins not satisfying the requirements is greater than the number given in col 3 of the table, the lot shall be rejected as not conforming to the requirements for these characteristics.

B-1.2.2 The lot shall be considered to have satisfied the requirements given in the standard, if the test results (or the average of test results, as the case may be) of the specimens taken from each of the special proofed paulins satisfy the specified requirements given in this standard.

B-2. CRITERIA FOR CONFORMITY

B-2.1 A lot shall be declared as conforming to the requirements of the specification, if all the test results for the different characteristics given in **B-1.2.1** and **B-1.2.2** are found satisfactory.

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