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PAPER LAMINATED

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Issued by:

CONTROLLERATE OF QUALITY ASSURANCE
(MILITARY EXPLOSIVES)
AUNDH ROAD, PUNE-411 020.

DEPARTMENT OF DEFENCE PRODUCTION
MINISTRY OF DEFENCE

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AMENDMENT RECORD

Brief Particulars of alterations.	Date	Authority	Numeral to which specn .is advanced	Remarks

CONTENTS

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0. FOREWORD

0.1 This specification has been prepared by the Controllerate of Quality Assurance (Military Explosives), Aundh Road PUNE-411 020.

0.2 For additional copies or any other enquiry regarding this specification, reference should be made the QA Authority named in the tender or contract CQA (ME), Aundh Road

1. SCOPE

1.1 This specification is meant to govern supply and inspection of paper, laminated, suitable for manufacture of composite containers, liners and sieves for packing ammunition stores.

1.2 The following materials when used in the production of Laminated Paper have been found to give Laminated Paper of required quality conforming to this specification.

(i) Paper Commercial Kraft to specification IND/ME/789.

(ii) Polythene, Low density to specification JSS 9330 - 03: 2007, Rev No. 2

This information is for guidance of Manufacturer.

2. RELATED SPECIFICATION AND DOCUMENTS.

2.1

IND/ME/789(a)	-	Paper Commercial Kraft for Ammunition purpose.
JSS : 9330.03.2007 Rev No. 2	-	Polythene low density, Linear low density and high density.
I.S.1060 : (Pt, I - 1966 Pt . II- 1960)	-	Methods of sampling and test for paper Part I and II and allied products.

2.2 Wherever a reference is made to any standard document in this specification, it shall be taken as a reference to the latest edition of that document, unless specified otherwise.

2.3 Copies of this specification and other related specification are obtainable on payment basis as follows :-

SPECIFICATION		SOURCE OF SUPPLY
IS Specification	:	The Bureau of Indian Standard, Manak Bhavan 9, B. S. Zafar Marg, NEW DELHI- 110 002.
IND/ME/ Specification	:	C. Q. A. (ME), AUNDH ROAD, PUNE - 411 020.
JSS	:	The Director Directorate of Standardization Standardization Documents Centre Ministry of Defence Room no 05, 'J' Block Nirman Bhawan PO New Delhi – 110 011

3. MATERIAL

3.1 The paper shall be made from paper commercial Kraft and sandwiched with polythene. The Kraft paper used in two layers shall be of the same thickness and such as to give the sandwiched paper, conforming to schedule as given in the, table at Para 7 (b).

4. MANUFACTURE AND FINISH

4.1 The paper, laminated shall be uniformly made and shall be, free, from lumps, pin holes, folds, wrinkles and delaminations.

4.2 The paper shall be supplied in the required grade in sheets, or rolls of such size as may be prescribed in the contract.

5. TENDER SAMPLE

5.1 The contractor shall submit free of charge, a tender sample not less than 3 square metre in sheet or roll form. The sample shall be kept flat, preferably rolled, free from wrinkles and folds and kept protected from exposure.

6. QUALITY ASSURANCE

6.1 Inspection

6.1.1 The paper, laminated shall be subject to inspection by and final approval of the QA Officer or his authorized representative. Samples of the material may be taken from any portion of the consignment.

6.1.2 If, on examination, any sample be found not to conform to this specification, the whole consignment may be rejected.

6.1.3 In order to avoid the rejected material being re-offered for inspection, the QA Officer shall ensure that the rejected material is kept in bond room till the supply against the particular contract is completed.

6.2 Sampling

6.2.1 Not less than five percent of the, packages shall be sampled. Four contiguous representative sheets shall be taken from each package. Samples from rolls shall not include the meters and shall be cut with edges, parallel to the machine and cross direction of the paper respectively.

6.3 Test Requirements

6.3.1 The sample taken from any portion of the consignment shall be on accordance, with clauses No. 3 and 4 and shall also comply with following requirements.

(a) CHEMICAL:

Sl.	Characteristics	Limits	Test Methods Ref, to IS 1060 Part I and II
1.	Moisture content at 103°C - 105°C % Max.	7.0	Part I - 9
2.	Ph of water extract Max. / Min.	7.5 / 5.5	Part I - 10
3.	Water soluble chlorides calculated as Sodium Chloride (NaCl) Per cent. Max.	0.05	Part II – 17 or Appendix 'G'
4.	Water soluble sulphates calculated as Sodium sulphate (Na_2SO_4) Percent by mass Max.	0.25	Part II - 18
5.	Fatty acids, calculated as oleic acid Per cent by mass, Max.	0.25	Part II - 19
6.	Ash on incineration at 800°C ± 25 deg C Percent by mass, Max.	7.5	Part I & II
7.	Alkalinity calculated as Calcium Carbonate ($CaCO_3$) Percent by mass, Max.	2.0	Appendix 'A' to this specification

(b) PHYSICAL

The material shall be conditioned prior to test for 24 hours in an atmosphere, of 65 ± 2 per cent relative humidity and 27 C ± 2 deg C.

Sl. No	Characteristics	Limit			Test Method
		Gr. No. 1	Gr. No. 2	Gr. No. 3	
1.	Thickness (total)mm Min. Max.	 0.25 0.33	 0.45 0.53	 0.65 0.73	Appendix 'E' to this specn.
2.	Thickness of polythene mm Min.	0.05	0.05	0.05	Appendix 'F' to this specn.
3.	Substance in g/m^2 Min.	200	340	480	-
4.	Bursting strength kPa Min.	313.8	519.8	686.5	-
5.	Breaking load, N/cm, Min. (a) MD (b) CD	 88 49	 98 69	 127 79	IS 1060-1966.
6.	stretch Min per cent (a) MD (b) CD	1.5	1.5	1.5	-do-
7.	Resistance, to water penetration.	-----To pass the test--------			Appendix 'B' to this specn.
8.	Delamination in water	-----To pass the test--------			Appendix 'C' to this specn.
9.	Delamination at high temperature and humidity.	-----To pass the test--------			Appendix 'D' to this specn.

7. PACKING AND MARKING OF PACKAGES

7.1 The paper is to be delivered flat and unfolded in reams of 500 sheets, Each ream is to be trapped in good quality packing paper and 10 such reams are to be wrapped in hessian cloth to form a bale. The bale is to be placed between two suitable thick boards, (word or paper) one on top and one at bottom, and the assembly banded all round by hoop iron or by synthetic strap (nylon or polypropylene) banded of about equipment strength to hoop iron for safe rail or road transit normal handling.

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7.2 When the supply is required in rolls, each roll shall be wound on a suitable hollow paper board core and packed in the manner described in the sketch attached to this Specification banded securely either by two steel straps or by synthetic straps (nylon or polypropylene) of about equipment strength to hoop iron.

7.3 When the supply is required in coils or strips (e.g. 10 cm wide, 13.2 cm wide), the strips shall be wound on separate hollow paper board cores and the coils so wound shall be assembled adjacently on a common hollow paper board core so as to form a composite roll. The packing of these composite rolls shall be similar to Clause 9.2 above and as described in the sketch attached to this specification. The packing should be such that it shall withstand rail or road transit and shall reach consignee's end in undamaged condition.

7.4 Width of the roll shall be as per contract and diameter of the coil or roll (cross sanction) shall be 61-74 cm unless otherwise specified.

7.5 The outside, of each packages shall bear the lot/batch No., Contractor's initials or recognized trade mark, contract number, date of Supply, description of the paper as defined in the contract, serial number of package, net and tare mass, and number of packages per lot,/batch.

or alternatively

7.6 The packaging (preservation, identification and packing) shall be in accordance with the, terms of the contract.

8.0 DEFENCE STORES CATALOGUE NUMBER

8.1 Defence stores catalogue number allotted to these stores are

i) Paper Laminated Gr. I 8135 - 000 134
ii) Paper Laminated Gr. II 8135 - 000 135
iii) Paper Laminated Gr.III 8135 - 000 136

9 SUGGESTIONS FOR IMPROVEMENT

9.1 Any suggestion for improvement in this particular document may be forwarded to The Controller, C. Q. A. [ME], Aundh Road, PUNE -411 020.

Date: 18.06.2014

(Smt. MGP DHANRAJ)
OITC
CQA [ME], PUNE.

10. APPENDICES

APPENDIX 'A'

Determination of Alkalinity as $CaCO_3$

A.1 5 g of the paper, cut into small pieces are placed in a stoppered glass cylinder containing 250 ml N/50 hydrochloric acid. The mixture is allowed to stand with occasional stirring for one hour. At the end of the period a portion of the solution is decanted and titrated with N/10 sodium hydroxide using methyl orange as indicator.

APPENDIX 'B'

Resistance To Water Preparation

B.1. **Method of creasing**

B.1.1 Condition the material at a temperature of 27°C ± 2 deg C and a relative humidity of 65 + 2 per cent for at least 24 hours.

B.1.2 Cut a 30 cm square from the conditioned material, fold (not crease) along one of its diagonals and place, a 2.5 kg flat bottomed mass 10 cm diameter upon it so that it is centered over the fold to produce a crease After 30 seconds remove the mass open the test piece and fold along its other diagonal with the reverse side folded in and repeat the creasing under mass process in the same manner, thus forming a crease at right angles to the- first crease.

B.2 **Method of Test (Sketch for apparatus attached)**

B.2.1 Cut six holes in the creased test piece so that it can be placed flat on the base plate (D) and assemble the apparatus as follows: - Fit one rubber gasket (C) on the base plate (D) followed by a filter paper 20 cm diameter. Place the test piece in position followed by another rubber gasket. (B) and finally by the flanged cylinder (A), end screw down tightly the six nuts (E). Carefully pour water containing 1 per cent of rosin into the cylinder to a depth of 10cm, after 24 hours examine the filter piper for staining.

APPENDIX 'C'

Delamination In Water

C.1 Cut 3 specimen, approximately 7.5 cm^2 and immerse in water at a temperature of 27°C ± 2 deg C for one hour. No Signs of delimitation or breakdown shall be visible.

APPENDIX 'D'

Delamination At High Temperature And Humidity

D.1 Cut 3 specimen, approximately 7.6 cm^2 and subject them to a temperature, of 38° C ± 2 deg C and in relative humidity of 90 ± 2 per cent for a period of 168 hours. No signs of delamination or breakdown shall be visible after the end of storage period.

APPENDIX 'E'

Determination Of Total Thickness

E.1 Condition the material at a temperature of 27°C ± 2 deg C and a relative humidity of 65 + 3 per cent for at last 24 hours. Cut 10 specimens, each 7.5 cm^2 diagonally across the sample, Determine the thickness of each specimen using a dead mass type thickness tester, The pressure foot shall exert a steady pressure of 52 ± 3.4 kPa. The mean value of the 10 determinations is the thickness of the material.

APPENDIX 'F'

Determination Of Thickness Of Poly thene

F.1 Cut 10 specimens each 7.5 cm square, diagonally across the sample. Immerse each specimen in 10 per cent alcoholic potassium hydroxide solution, After 20 minutes remove the specimens from the solution and carefully separate the paper from the polythane. Wash the polythene with distilled water and dry between filter papers. Determine the thickness of each specimen using a dead weight type thickness tester. The pressure foot shall exert in steady pressure, of 52 ± 3.4 kPa, The mean value of the determinations is the thickness of the material.

APPENDIX 'G'

Determination Of Water Soluble Chlorides:-

Weigh accurately 5 g of the test sample (M) cut into small pieces (1 cm) and reflux in 500 ml Erlenmeyer flask with 150 ml distilled water for one hour. Decant the extract and re-extract the sample once again by boiling with 100 ml distilled water for 15 minutes. Combine the extracts and filter if necessary. Cool to room temperature.

To the combined water extract add 5 ml of concentrated Nitric Acid. Stir well and filter if necessary. Add a known volume (5 ml or 10 ml) of N/20 Silver Nitrate solution by pipette, to precipitate soluble chlorides as Silver chloride, Boil the solution for 2 to 3 minutes for coagulating the – ppt and cool. Titrate the excess of silver nitrate against Standard N/20 Ammonium/Potassium thiocyanate solution using 5 ml of 10 % Ferric Alum solution as indicator (Titre A). Carry out a blank determination on the same amount of water and reagents used (Titre B).

Calculate the percentage of water soluble chlorides as sodium chloride.

$$\text{Percentage chlorides as NaCl} = \frac{0.2923(B - A)\,F}{M}$$

Where, F = Factor for N/20 Ammonium/ Potassium Thiocyanate solution.