

Paper Liner

(B)

TO THE C (g) ...
CQA (A) letter
TS 04088/018A/10/1/8/80

33749A

DC(1) 23056-A

SPECIFICATION I.A. 918-C (F) (P)

(Based on UK Provisional Specification L/9719-C)

THIS SPECIFICATION IS THE PROPERTY OF THE DIRECTOR GENERAL OF INSPECTION AND MUST BE RETURNED TO THE CONTROLLER OF INSPECTION (AMMUNITION), KIRKEE.

THIS SPECIFICATION, or any Patterns, Drawings or other information issued in connection therewith, MAY ONLY BE USED for specific enquiries, tenders or orders placed by COMPETENT AUTHORITY. It is not to be used for any other purpose whatsoever WITHOUT THE SANCTION OF THE DIRECTOR GENERAL OF INSPECTION.

CYLINDRICAL PAPER LINERS, PAPER DISCS AND FITTINGS
for use within WATERPROOF AMMUNITION CONTAINERS

General Specification to govern manufacture and inspection.

Provisionally Approved 5th October, 1949
Approved for India 3.8.1953

Specns
181

SECTION I - GENERAL

1. The supply of all materials or articles produced in accordance with this specification shall be governed by the Standard Conditions of Government orders for stores purchased as published by the Government.
2. The liners and discs shall consist essentially of paper or paper board fabricated in form of cylinders and discs as shown on the relevant Drawing issued with this Specification. Special attention is directed to any notes on the Drawings which explain the system of dimensioning adopted.
3. Where the Drawing or Specification permits a choice of alternative materials or forms for particular components, the Manufacturer is required to notify the Inspecting Officer, in writing, which of the permitted alternatives he chooses to produce. If the choice of alternatives is changed during the course of the order, the Manufacturer shall again notify the Inspecting Officer of such change.
4. Any sample lent to the Manufacturer must be taken only as a general guide to workmanship and finish, and not as a guide to dimensioning or quality of material.
5. Any question relating to the drawings, patterns or this Specification should be referred to the Controller of Inspection (Amm), KIRKEE, or other Inspecting Officer duly authorised to act on behalf of him (hereinafter called the Inspecting Officer).

Paper Liner.

IA/918-C-(g) 33749-A. 2/-
& Drg. NO. ARM-1503-C

6. The stores may not be built up or repaired in any way not provided for by the Drawing or this Specification unless authorized by the Inspecting Officer.

7. The Manufacturer must notify the Inspecting Officer when he is in a position to start work and must inform him of all sub-orders placed in connection with his order as soon as they are placed in order that the necessary arrangements may be made for testing the materials.

8. The Inspecting Officer, on receipt of the notification from the Manufacturer, may also arrange to be represented at the works of the latter or at those of his sub-Manufacturer or sub-Manufacturers.

9. Before proceeding to manufacture, the materials must be submitted (in batches) to the Inspecting Officer for testing purposes in all cases where tests are laid down in this specification or elsewhere as a condition of acceptance, and the Manufacturer must not take into use any material before it has been accepted by the Inspecting Officer as satisfactory for the purpose intended. When samples or test pieces are selected for analysis or test, the Inspecting Officer may require the bulk represented to be bonded or sealed pending the results of analysis or test.

10. The Manufacturer will be required to supply, free of charge, the necessary material for test or analysis and such material normally be selected by the Inspecting Officer or his representative.

11. Where finished or partly finished articles or components thereof are expended or damaged in test, retest or examination as stipulated for in this Specification or elsewhere as a condition of acceptance the Manufacturer supplying the article or components thereof will be required, free of charge, to supply, replace or repair the number so expended or damaged which become the property of the Government.

SECTION II - MATERIALS AND COMPONENTS

1. The following materials may be supplied to the Manufacturer by the Purchasing Department. If to be supplied by the Manufacturer, they must conform to their respective current approved specifications, copies of which will be issued :-

- Chipboard
- Board, Pitch and/or Bitumen Sized
- Paper Waterproof Bitumen or
- Coal tar pitch impregnated. * (8)
- Adhesive, Non-Corrosive and Waterproof or Casein glue * (8)
- Cement RD 4492-K, Ammunition * * * (8)
- Paint, Prepared for use, Ammunition, Marking (Yellow
- Lemon or Golden Yellow)
- Water resistant Lacquer; Amn. protective Composition No. 225 (varnish)
- Paranitrophenol shellac 30% to Specn. JSS 8036-14 (8)
- Sodium Pentachlorophenate
- Sodium Orthophenylphenate

Alternative paper laminated to specn IND/ME/786 (latest issue) with synthetic adhesive to specn IND/ME/788 (latest issue) with suitable impregnated synthetic adhesive to specn IND/ME/788 (latest issue) 3/-

* Amn. protective Composition NO. 2 (current RD 1192K, Amn.) to Specn. JSS 8036-14

NOTE : When casein glue is used, following fungicides with minimum percentage shown against each are required to be added to the glue.

- a) Paranitrophenol 1%
- b) Sodium Pentachlorophenate 2%
- c) Sodium Orthophenylphenate 2%

2. Where component parts are required by schedule or design to be assembled to the liner, they shall be manufactured from the materials called for in the drawing, which must comply with their respective current approved specifications.

SECTION III - CONSTRUCTION

1. The liners and discs shall be fabricated from approved materials.

1. Before lacquering/varnishing and sealing, it should be ensured that liners and discs are kept so that the moisture content does not exceed 5%. Then lacquering/varnishing and sealing should be completed within 48 hours. The end shall be sealed with A.P.C. No. 2 (Cement R.D. 1192 K, Ammunition).

2. Liners and discs manufactured from water proof 150 timer paper are to be lacquered internally and externally by water resistant lacquer and thoroughly dried.

2.1. Liners and discs manufactured from laminated paper will be finished with two coats of approved A.P.C. No. 225 (Varnish shellac 30%) internally and externally. It should be ensured that a 2nd coat is applied only after the 1st coat has dried.

2.2. The moisture content must be 2 per cent. r.n. and 294.15 + 1K until equilibrium is reached, must comply with the dimensions and tolerances shown on the drawing.

3. Any liner or disc when heated to 333.15K for 4 hours must show no signs of tackiness.

4. Corrosion Test : When portions cut from the wall of a liner or disc are tested in accordance with the method described in Appendix I, the loss in mass of the metal test pieces must not exceed the following :-

Mild Steel	10 mm.
Brass	2 "
Copper	1 "
Aluminium	2 "
Zinc	4 "

... 4/-

A-3. Metal fittings as specified in the drawings are to be painted as per drawing.

4 :

SECTION V - MARKING

1. The liners and discs are to be stencilled with Yellow Paint with the particulars and in the positions indicated on the relev Drawing. When the liners and/or discs are supplied by trade firm the following additional markings will also be stencilled :-

Nomenclature of the store, Contractor's initial or recognised trade mark & Month and Year of manufacture.

SECTION VI - PACKING AND DELIVERY

1. The liners and discs are to be suitably packed to prevent damage in transit and the packages to be marked as to be readily identified with the Order on which supply is ordered.

2. They are to be delivered in accordance with the terms of order.

SECTION VII - INSPECTION

1. The liners and discs and/or materials used in complying with this Specification may be inspected by the Inspecting Officer during the process of manufacture. For this purpose the Inspecting Officer shall, as a condition of the order, have the right of access into the Manufacturer's factory, and/or to the Works of any sub-manufacturer where work on this Order may be in progress. The Inspecting Officer may, at his discretion and for the purpose of analysis and testing, take samples of any of the materials used.

2. On completion, the work will be subject to examination by and to the final approval of the Inspecting Officer, either at the Manufacturer's works or after delivery, as may be determined by the Inspecting Officer.

3. If at any time during examination it is found that there are departures from the approved designs or defects of any nature to the average 5 per cent. of the liners or discs in the lot, further examination of the lot will be suspended. The whole of the lot must be re-examined by the Manufacturer and those liners or discs which are incorrect withdrawn for rectification by him. The lot may then be re-submitted for examination.

Sd/-

(AJ DAWSON)

for CHIEF SUPDT. OF DEVELOPMENT
for DIRECTOR OF TECHNICAL DEVELOPMENT

- NOTES :
- (1) This Specification is to be returned to the Controller of Inspection (Amn), KIRKEE, immediately on submission of tender or completion of order.
 - (ii) This Specification only holds good for the particular order for which it was issued.

Correct copy of the sealed specification at this date.

KIRKEE, PUNE-411003,
 DATED 07 May 1990

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 (AH PANICKER)

DSS JSO
 BY ASST CONTROLLER
 for CONTROLLER OF INSPECTION (AMN)
 QUALITY ASSURANCE
 (AMN)

APPENDIX I

PREPARATION OF ASSEMBLIES1. TEST

Two 57 mm squares are taken and conditioned for seven days above a saturated solution of pure Ammonium Dihydrogen Phosphate ($\text{NH}_4\text{H}_2\text{PO}_4$) at 299.85K (equivalent to approximately 90 per cent relative humidity).

The metal test piece 51 mm, .6 mm to .8 mm thick, perfectly flat, is prepared and weighed (see Note 1 below).

With the materials prepared as above, a sandwich assembly is prepared as follows :-

On each side of the metal plate are placed, in order, a square of the sample, a 57 mm square of Whatman No. 40 filter paper (previously conditioned with the sample) and a 57 mm square of clean glass plate.

The sample test piece should be arranged so as to present one back and one front surface to the metal plate. The whole assembly is bound with two loops of nichrome wire at right angles.

2. LINERS (INNER SURFACE)

A 76 mm length of the liner is taken and conditioned for seven days as above.

Four metal test pieces each 51 mm by 51 mm, .6 mm to .8 mm thick curved to fit the inner surface of the liner are prepared and weighed in pairs (see Note 1 below). One surface of each metal test piece should now be coated with Necol varnish.

The four metal test pieces are spaced equally round the inner perimeter of the conditioned portion of the liner, with weighed pairs diametrically opposite, the unvarnished surface being in contact with the liner. The plates are held in position by a screw clamp device. (see Note 2 below).

One 76 mm length of liner will be used for the steel and aluminium pairs, a second 76 mm length for the brass and copper pairs and a third for the zinc pairs.

3. LINERS (OUTER SURFACE)

A similar test to (2) above is carried out using metal plates curved to fit the outer surface.

In this instance the plates may be held in position by binding with nichrome wire, the wire being electrically insulated from the plates by the use of polyethylene sheet of thickness 0.127 mm.

As an alternative to this procedure, wire coated with E.V.C. or Polyethylene can be used.

4. METHOD OF TEST

The assemblies described in 1, 2 and 3 are placed in a chamber heated to 333.15K over saturated Ammonium Dihydrogen Phosphate, $(\text{NH}_4\text{H}_2\text{PO}_4)$ for seven days.

The metal test pieces are then removed and freed from varnish (where necessary) and corrosion products as described in Note 3 below.

The metal test pieces are then re-weighed (in pairs where appropriate) and the total loss in mass recorded in milligrams.

NOTE 1

The metals used are controlled by the following specifications :-

Steel	B.S./IS:1079:1968 ST-34
Brass	DEF 105
Copper	IS:191 FRTP1
Aluminium	IS 737 (latest issue)
Zinc	BS 3436 Zn1

The plates, which must be free from sharp edges, are prepared as follows :-

STEEL

The plate is abraded on both sides with No. 0 emery cloth, to comply with B.S. Specification 871-1939, using metal polish as a lubricant, wiped clean and degreased by swabbing generously with Toluene Sulphur free, using a clean cloth or filter paper.

It is then treated with Methyl Alcohol and dried in a stream of warm dry air, cooled and weighed.

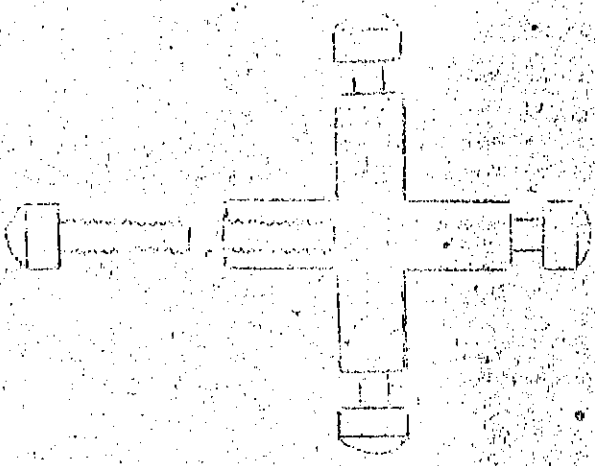
BRASS, COPPER, ALUMINIUM AND ZINC

These are polished on both sides with metal polish on a soft cloth, degreased, washed, dried as for steel, and weighed.

In all cases the plates must not be touched by hand after polishing.

NOTE 2

A type of apparatus for clamping the plates in position is shown below :-



The screwheads should be insulated from the metal plates by the insertion of Polyethylene sheet of thickness 0.127 mm.

They are screwed outward against the plates until finger tight.

NOTE 3

Corrosion removal is carried out in the following manner. The Necol varnish is first removed from the plates using acetone as solvent.

STEEL

The corrosion products are removed by means of an inhibited acid, a method found suitable is as follows

To a 10 per cent solution of sulphuric acid at 333.15K is added slowly with stirring 1 per cent of Galveno solution. (Galveno is supplied as a solution in 60 per cent. sulphuric acid).

The resulting solution is allowed to cool.

The steel plate is immersed in this solution at room temperature for two minutes, it is then removed and thoroughly washed in water and the corrosion removed by rubbing with a rubber policeman preferably under running water.

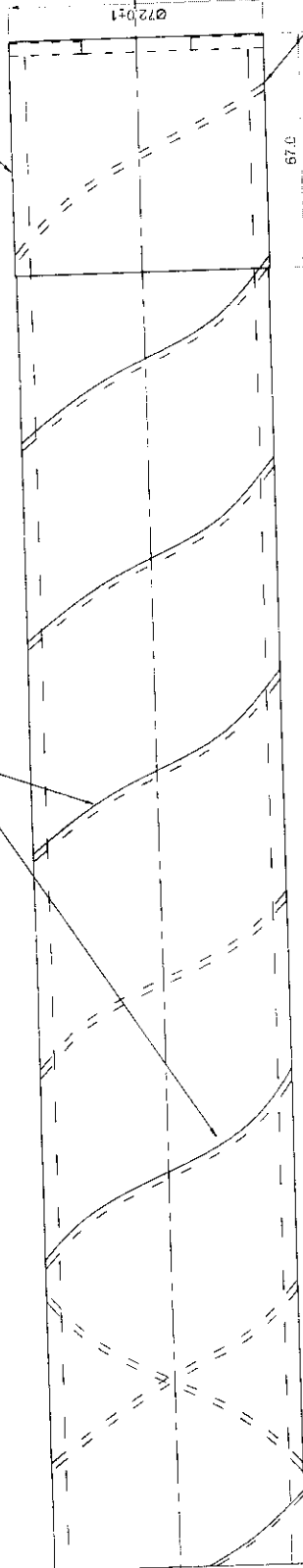
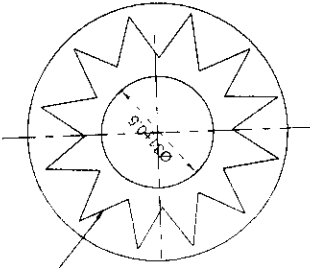
..... 9/-

DRG NO :-
ARM 1503 C

DRAWING CONVENTIONS ARE BASED ON IS: 696

PAPER (0.4mm THICK) WRAPPED
AND PESTED WITH GUM
TO HOLD THE BOTTOM DISC

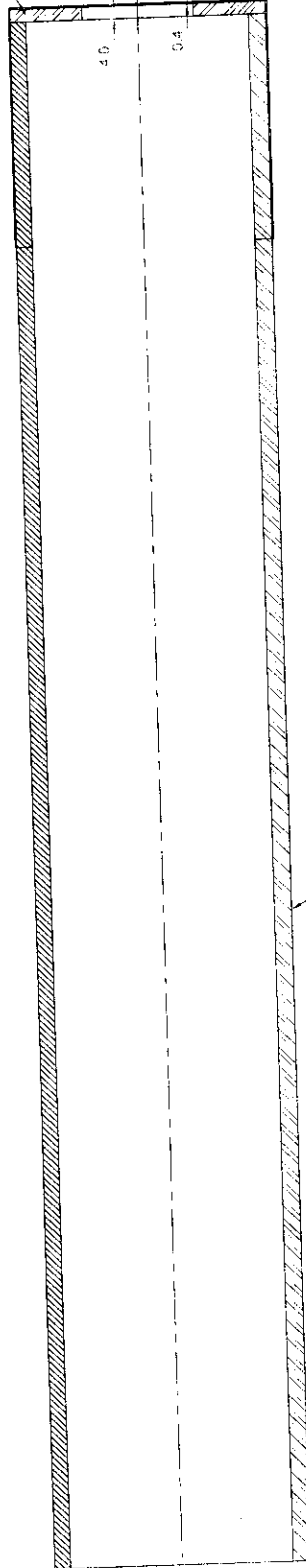
SPIRALLY WOUND



435.0 ± 1

67.0

BOTTOM DISC



4.0

0.4

0.310 ± 0.05

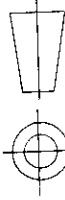
PAPER LINER

NOTE S :-

- 1) THE PAPER LINER IS TO BE FINISHED WITH TWO COATS OF APPROVED VARNISH SHELLAC APC - 225.30% TO SPON J.S.S. 8010 - 63 - 2004 REVISION NO.2 BOTH EXTERNALLY INTERNALLY AND THORO UGHLY DEIED
- 2) PAPER LINER AS PER SPECN NO 1A918C (G)
- 3) USES IS LIMITED FOR INTER FACTORY MOVEMENT ONLY

DGN	MATL SPON :- PAPER LAMINATED SHELLAC IND/ME/786 (PROV)
DRN	
CHD	SEC. REF NO
TCD	GAUGE SCHD NO :- 1
COMP	DRG LIST NO :-
SCALE :- 1:1	TITLE :- PAPER LINER FOR 68mm ARROW CHARGE (PROV)
TOL :- EXCEPT WHERE OTHER WISE STATED TO IS:2402 (MED)	
19.8.87	
SA/-	
TRACED WITHOUT CHANGE	
BRIEF RECORD	
R. NO.	DATE
	ZONE
	INITIA

D. G. A. O	MIN OF DEF
APPROVED :-	
DRG NO :-	ARM 1503 C



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