Specn.No ERDL/SCCC/PS/1187

(1)

(Provisional)

SPECIFICATION FOR COATED CAMBRIC DISC & STRAP 125 MM SCCC AMMUNITION

FOR REFERENCE

EXPLOSIVES RESEARCH & DEVELOPMENT LABORATORY

ARMAMENT POST, PASHAN, PUNE - 411 021

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

TENDER SAMPLE

The contractor shall submit a sample 3 % of the lot of 1000 Nos of discs & straps or the nos decided by the inspecting officer.

The contractor shall submit a sample of 500 g (minimum) in sheets of 30 x 30 cm or in other convenient size decided by the inspecting officer.

EXAMINATION

As per clause 7 of specn No. ERDL/P/PS/110(prov).

PACKING AND DELIVERY

500 nos of discs are wrapped in clean stout paper. Such 20 packets (total 10,000 discs) are packed in wooden box, (lined with aluminium sheet) of size ~~600~~ 650 x ~~250~~ 260 x ~~250~~ 260 mm.

100 nos of straps are wrapped in clean stout paper. Such 100 packets (total 10,000 straps) are packed in wooden box (lined with aluminium sheet) of size 440 x 270 x 270 mm.

Each package must be clearly & legibly marked 'INFLAMMABLE' in red colour & with the name & mark of the contractor, nomenclature of the contents, order number, date of supply, and tare & net weights, & date of manufacture.

INSPECTION

1 As per specn No. ERDL/P/PS/110 (Prov)

SUGGESTIONS

1. Suggestions for improvement in this particular document may be forwarded to the Director, ERDL, Pashan, Pune-21.

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

(R.K.SYAL)
SCIENTIST 'E'

(12)

Specification No: ERDL/SCCC/PS/187
dated 25th Apr 90

COATED CAMBRIC DISC & STRAP

1. SCOPE

1.1 This specification is meant to govern manufacture and inspection of coated cambric disc & strap.

1.2 The material is used in combustible component for 125 mm Tank Gun Ammunition.

2. DESCRIPTION

The coated cambric discs & straps are manufactured from coated cambric sheet, which consists of cambric cloth coated uniformly on both sides with a mixture of Nitrooellulose, camphor & carbamite in the proportion specified in para 3 of specification No.ERDL/P/PS/110 (Prov) & Appendices I,II & A for references with the aid of suitable solvent system.

2.2. SIZE

a) The disc dia 114 ± 1 mm.

b) The strap length 435 ± 5 mm & width 25 ± 1 mm

c) ~~mm~~. The disc dia 123 ± 1 mm

2.3 WEIGHT

a) Disc of 20 Nos bundle 40 ± 3 g.

b) Strap of 20 Nos bundle 42 ± 3 g (c) Disc of 20 Nos. bundle – 41 ± 3 g.

3. COMPOSITION

As per clauses 3.1,3.2, 3.3 of specification No. ERDL/P/PS/110 (Prov).

4. INGREDIENTS

As per clause 4 of specification No. ERDL/P/PS/110(Prov)

5. SAFETY OPERATION.

As per clause 5 of specification No. ERDL/P/PS/110 (Prov).

For Travancore Precision Components Pvt. Ltd.

Contd...2

ARUN KUMAR HARI
Executive Director

4. INGREDIENTS

The ingredients and materials used for the manufacture of coated cambric sheet shall comply with the current approved specification as shown below:-

a) Cambric cloth, cotton - JSS-1-69-02(b) IS:5088

b) Nitrocellulose - (N_2 content 12.0 + 0.1%) viscosity in 1% Hercules solvent : 5-8 c/s

c) Camphor - IND/ME/458

d) Carbamite - JSS 1059

e) Acetone - IND/ME/8 or IS 170-1976

f) Ethyl alcohol - IND/ME/35(a) or IS-323

g) n-Butyl acetate OR - IS 230 - 1972
Amyl acetate - IS 231

5. SAFETY OF OPERATION

Nothing in this specification shall relieve the contractor of his responsibility for the safety of his operations.

6. TENDER SAMPLE

The contractor shall submit a sample of 500 g (minimum) in sheets of 30 x 30cm or in other convenient size decided by the inspecting officer.

7. EXAMINATION

Samples drawn from any portion of the supply shall be in accordance with clauses (2) and (3) and in addition, must comply with the following requirements when tested as per the methods given in specification IND/ME/817(Prov.) for celluloid sheet transparent.

REQUIREMENTS OF COATED CAMBRIC SHEET

a) Chemical

Sl.No.	Test	Requirements	Test method
1.	Volatile matter(% max)	2.5	
2.	Sulphur compounds calculated as H_2SO_4 (%max)	0.15	As per methods given in Spcn. IND/ME/817 (Prov.)
3.	Surface acidity	shall pass the test.	
4.	Nitrogen content of nitro cellulose (%)	11.9 to 12.1	JSS 1375-03 :1998
5.	Mineral matter (% max)	0.5	

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

(3)

SPECIFICATION NO.ERDL/P/PS/110

This specification or any patterns, drawings or other information issued in connection therewith may only be used for a specific order placed by competent authority. It is not to be used for any other purpose. What so ever, without the express written sanction of the Director, ERDL,Pashan, Pune-411 021.

COATED CAMBRIC SHEET

(Specification to govern manufacture and inspection)

1. SCOPE

1.1 This specification is meant to govern manufacture and inspection of coated cambric sheet.

1.2 The material is suitable for fabrication of containers for use in secondary charges for Bomb 81mm and 120mm Mortar HE ~~xxxx~~ in lieu of celluloid containers.

2. DESCRIPTION

The coated cambric sheet is to consist of cambric cloth coated uniformly on both sides with a mixture of Nitrocellulose, comphar and carbamite in the proportion specified in para 3 below with the aid of suitable solvent system.

3. COMPOSITION

3.1 The composition of coated cambric sheet calculated on material free from volatile matter as per methods at appendix-I is to be as follows:-

Cambric cloth (%)	:	40.5 ± 3.5
Coated solids (%)	:	59.5 ± 3.5

3.2 The composition of coated solids determined as per the methods given in Appendix-I shall be as follows:-

Nitrocellulose (12.0 ± 0.1% N_2)	: 75 ± 3%
Camphor	:23.5 ± 3%
Carbamite	:1.5 ± 0.2%

3.3 The solid content (Nitrocellulose, camphor and carbamite) and the mass of cambric cloth per sq. metre of coated sheet, as determined in accordance with the method at Appendix-II, shall be 100 ± 5 g and 68 ± 7 g respectively.

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

..02/-

APPENDIX-I

DETERMINATION OF PERCENTAGE COMPOSITION OF COATED CELLULOID (" SOLIDS ")

1. Preparation of material for analysis.

The coated sheet is cut into small pieces of approximately 2 to 3 mm sides and placed in a labelled and stoppered tube for analysis.

2. Volatile matter:-

Determination must be carried out as soon as possible, after cutting the sample into pieces.

5 g of the cut pieces, placed in a tared weighing dish are exposed for 48 hours over concentrated sulphuric acid, in vacuo using vacuum desiccator. From the loss in mass of the sample, content of volatile matter is calculated.

3. Chemical analysis of coated sheet:

3.1 Nitrocellulose and Cloth.

Weigh 3 ± 0.1 g of prepared sample in a clean, G-3 grade, sintered glass crucible and extract for 15 to 20 hours with pure ethyl ether in a modified wiley-type extraction apparatus using 250-ml conical flask as the extraction vessel.

After, extraction, the insoluble residue left in the crucible is dried in a boiling water oven and weighed to give combined amount of nitrocellulose and cloth ....W1 g.

In order to separate cloth from NC the residue is transferred quantitatively to a 250 ml conical flask containing about 150 ml distilled acetone. The contents are shaken for about 30 minutes and allowed to stand for 5 to 10 minutes till the cloth pieces/fibres settle down. The supernatant NC solution is then filtered through the same crucible using mild suction. The process of washing with acetone is repeated twice using fresh instalments of 100 ml and 50 ml each. Finally, cloth fibres/pieces are quantitatively transferred to the crucible using more quantity of acetone, dried at 103-105°C and weighed to give the amount of cloth in the sample .....W2 g.

Nitrocellulose and cloth content of coated sheet is calculated on the material free from volatile matter as follows:

$$\% \text{ Cloth} = \frac{W2 \times 100 \times 100}{\text{Wt. of sample} \times (100 - \% \text{ V.M})}$$

$$\% \text{ Nitrocellulose} = \frac{(W1 - W2) \times 100 \times 100}{\text{Wt. of sample} \times (100 - \% \text{ V.M})}$$

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

....5/-

b) Physical:- Bursting strength (Kg/cm^2) - will be decided after testing first 10 batches. (4)

c). Stability:-

Sl.No.	Test	Requirement	Test method
1.	Small Vessel Test at 100°C	Shall pass 6 periods	As per methods given in Spcn. IND/ME/ 817 (Prov.) ✗ IS 1375-03 1998 ✓
2.	Puffing point (min.)	170°C	
3.	Puffing time (min) at 160°C	60 minutes	

8. PACKING AND DELIVERY

8.1 The sheets, cut to the required size, must be interleaved with tissue paper and wrapped in suitable numbers, in clean stout paper. Each bundle is to be tightly packed in sound, clean, dry well fitting wooden case, in such a manner as to ensure that the sheets remain flat and undamaged/undeformed.

8.2 Each package must be clearly and legibly marked 'INFLAMMABLE' in red colour and with the name and mark of the contractor, nomenclature of the contents, order number, date of supply, and tare and net weights.

9. INSPECTION

9.1 The manufacturer, before starting actual production will ensure that all ingredients have been duly inspected and accepted for use by inspecting officer.

9.2 The final product and the packages in which it is contained will be subject to inspection by and final approval of the inspecting officer.

9.3 The samples of the material may be taken from any portion of a consignment. If, on examination, any sample be found not to conform to this specification, the whole consignment may be rejected.

(A.S. BARTAKKE)SC'C'

APPROVED BY

(J.S. KARIR)SC'D'

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

APPENDIX-II

COATED "SOLIDS" AND MASS OF CLOTH PER SQUARE METRE

The coated sheet is cut into a square piece of exactly 10 X 10 cm size and weighed accurately (W1 g). The piece is placed in a 250 ml conical flask containing about 150 ml of acetone and the contents shaken well for 30 minutes. Acetone solution in the flask is then poured out and a fresh instalment of acetone (100 ml) is added and shaken for 10 minutes to dissolve residual celluloid. The washing of piece is repeated third time using fresh 100 ml of acetone.

After removal of celluloid, the piece is taken out from the flask and air-dried for 5 minutes. It is further dried for 15 minutes at 100°C and then conditioned for 24 hours at 65 ± 1% RH at room temperature. The piece is finally weighed accurately (W2 g) and contents of coated solids and cloth per suare metre of sheet are calculated as follows:-

Coated solids/m^2 (g) = 100 x (W1 - W2)

Mass of cloth/m^2 (g) = 100 x W2

Note: Accuracy of results depends upon the exactness of size of the cut piece taken for analysis.

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

3.2 Carbamite:-

From the conical flask containing the ether extract (obtained at para 3.1) ether is removed by distillation and carbamite is determined volumetrically by bromination in carbon tetra chloride using potassium bromate/potassium bromide solution.

% Carbamite is calculated on V.M. free material.

3 Camphor:-

The camphor content is obtained by difference.

4. Calculation of percentage composition of coated celluloid (" Solids ").

The percentage composition of coated celluloid is obtained by calculating the same on material free from cloth, thus,

$$\% \text{ NC} = \frac{\% \text{ NC in coated sheet} \times 100}{100 - \% \text{ Cloth in coated sheet.}}$$

$$\% \text{ Camphor} = \frac{\% \text{ Camphor in coated sheet} \times 100}{100 - \% \text{ Cloth in coated sheet.}}$$

$$\% \text{ Carbamite} = \frac{\% \text{ Carbamite in coated sheet} \times 100}{100 - \% \text{ Cloth in coated sheet.}}$$

....16/-

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

APPENDIX 'A'

PROCEDURE FOR PREPARATION OF CELLULOID DOPE

1. Preparation of Celluloid Dope :-

Composition of solid ingredients ("solids") of the dope is to be as follows :-

i)	NC - (12 ± 0.1% N_2)	:	72.5 ± 3%
ii)	Camphor	:	26.0 ± 3%
iii)	Carbamite	:	1.5 ± 0.2%

The celluloid dope is prepared by dissolving one part of the "solids" in 6.2 parts by weight of the solvent mixture made in the following proportion by weight :-

i)	Acetone	:	2 parts
ii)	Ethyl alcohol	:	2 parts
iii)	n-Butyl acetate	:	1 part

Note : 0.05% Dye Rhodamine B base, conforming to specification IND/ME/311 shall be added in a solvent mixture. This dyed dope should be used for manufacture of coated discs and straps.

The ingredients are thoroughly mixed till a homogenous dope is obtained. Viscosity of the dope should be 25 ± 2 sec at 25°C as determined by falling ball method using 1/8" steel ball.

Quantities of ingredients required for 5 kg batch of celluloid dope are given below for guidance.

Nitrocellulose	:	507.5 g
Camphor	:	182.0 g
Carbamite	:	10.5 g
Acetone	:	1736 g (2200 ml)
Ethyl Alcohol	:	1736 g (2200 ml)
n-Butyl acetate	:	868 g (980 ml)

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

4	3	2	1

PART NO: ISX415

DRAWING CONVENTIONS CONFORM TO IS: SPECIFICATION

DIMNS. ARE IN mm. ~~UNLESS OTHERWISE STATED~~

DC 36029-A

GEN. TOL. MEDIUM/~~COARSE/FINE~~ CLASS TO IS:2102

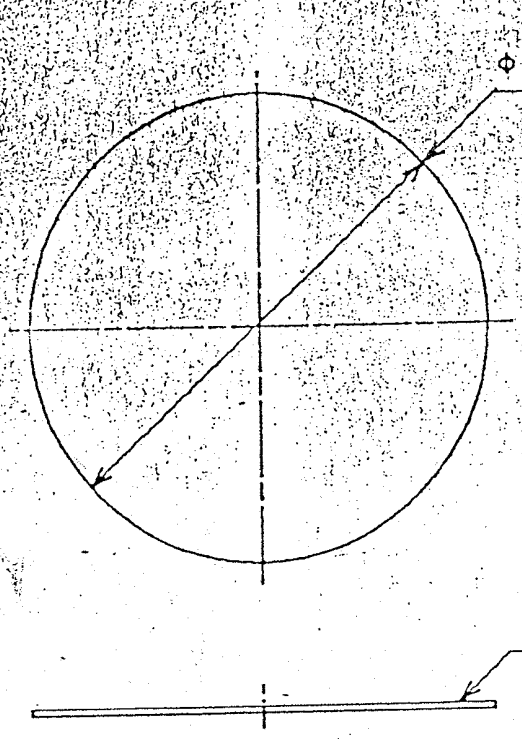
D

C

B

A

sfcp8



R. NO.	DATE	AUTHORITY	REVISION	ZONE	SIGN
					A/H.S.P D.O
	10.11.95	DC:36029-A	DRG. SEALED (PROV)		

ORG. SEALED :- 10.11.95 (PROV)

DRN. S.N.K	CHD.	TRD.	COMP.
CD	PASSED	SCALE: 1:2	
APPROVED	R.K.Sy FOR DIRECTOR	EST MASS:	
		GAUGE SCHD	
		DATE: 30-10-95	

MATL: TO SPEC. ERDL/P/PS/110 (PROV)

PROTECTIVE FINISH: ——

TITLE

NC COATED DISC

APPROVED: FOR CQA(A)

For Pavamcore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

ASSY. DRG. ISX 106 GF

DESIGN AUTHORITY

HEMRL PUNE-411021

DRG. No.

HEMRL DRG. 1364

DET. No.	SHTS.	SHT. NO

PART No. ISX 415

D.S. CAT. No.

A.H.S.P. CQA(A) KIRKEE

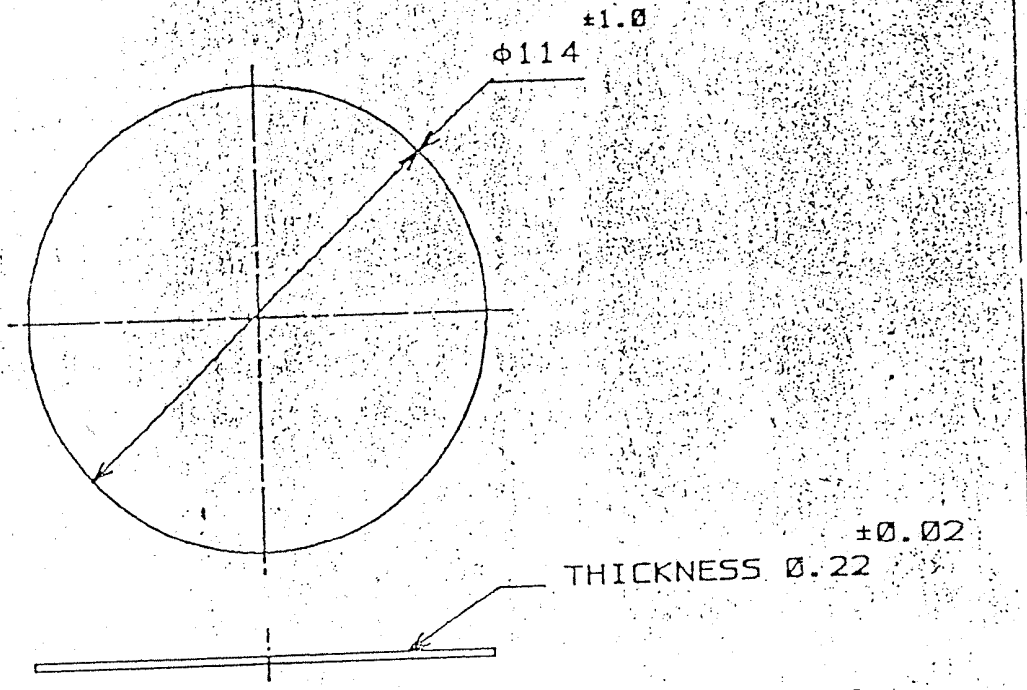
4	3	2	1

PART No. IRW 225

DRAWING CONVENTIONS CONFORM TO IS SPECIFICATIONS
DIMNS. ARE IN mm. ~~UNLESS OTHERWISE STATED~~

D.C 36029-A

GEN. TOL. MEDIUM/~~COARSE/FINE~~ CLASS TO IS,2102



R. NO.	DATE	AUTHORITY	REVISION	ZONE	AHSP	D.O
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DRG. SEALED :- 10-11-95 (PROV)

DRN. S.N.K	CHD.	TRD.	COMP.
CD	PASSED	SCALE: 1:2	
APPROVED	FOR DIRECTOR	EST MASS:	
		GAUGE SCHD	
		DATE: 30-10-95	

ASSY. DRG: IRW 33 AF

DESIGN AUTHORITY

HEMRL PUNE-411021

MATL: TO SPEC. ERDL/P/PS/110 (PROV)

PROTECTIVE FINISH: —

APPD. FOR C.Q.A.(A).

for Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

TITLE

NC COATED DISC-II

DRG. No.

HEMRL DRG. 1365

DET. No.	SHTS.	SHT. NO

PART No. IRW 225

D.S. CAT. No.

D.H.S.P.C.Q.A.(A). KIRKEE

3.2. Carbamite :

From the Iodine flask containing the ether extract (obtained in para 3.1) ether is remov by distillation and carbamite is determined volumetrically by the detailed procedure given below :

PREPARATION AND STANDARDISATION OF 0·2 NORMAL STANDARD SODIUM THIOSULPHATE SOLUTION

CHEMICAL/APPARATUS

(*a*) Sodium Thiosulphate, Pentahydrate AnalaR/GR reagent grade or equivalent.

(*b*) Sodium Carbonate, anhydrous AnalaR grade or equivalent.

(*c*) Hydrochloric Acid, 1N solution.

(*d*) Potassium Iodide (Iodate Free) AnalaR grade or equivalent.

(*e*) Starch Indicator solution (Method 818).

(*f*) Potassium Iodate/Potassium Dichromate GR/AnalaR grade or equivalent.

(*g*) Iodine Titration flask capacity 500 ml Borosil (R) or conical flask capacity 500 ml Borosil (R) or equivalent.

(*h*) Reagent storage bottle, amber coloured or plain painted black capacity 2·0 litres.

(*j*) Burette capacity 50 ml Class A Borosil (R) or equivalent.

(*k*) Measuring Cylinder Capacity 1·0 litre Borosil (R) or equivalent.

(*l*) Precision Analytical Balance Electronic Accuracy ± 0·1 mg.

(*m*) Air Oven, Accuracy ± 2 deg C.

(*n*) Glass Weighing Bottle with lid, capacity 10–15 ml.

To one litre of freshly boiled & cooled distilled water add 50 g of crystalised Sodium Thiosulphate GR/AnalaR and 0·1 g Sodium Carbonate or 3 drops of chloroform. Shake well and allow the solution to stand for at least 24 hours prior to standardisation. Weigh out accurately 0·30 ± 0·001 g (W) of pure Potassium Iodate GR/AnalaR (previously dried at 120°C for 1 hour and cooled in a desiccator) in a 500 ml dry conical flask. Dissolve this in 25 ml distilled water and add 4 g of Potassium Iodide GR/AnalaR and 10 ml of 1(N) Hydrochloric Acid. Titrate with the 0·2(N) sodium thiosulphate solution so prepared whilst swirling the flask. When the Iodine colour begins to fade add 2 ml of Starch solution and continue to titrate until the solution suddenly turns colourless. Record the volume of Sodium Thiosulphate from the Burette. Carryout the standardisation in triplicate and calculate the factor of 0·2 (N) Sodium Thiosulphate solution as follows :—

$$\text{Factor of 0·2 (N) Sodium Thiosulphate Solution} = \frac{W}{V \times 0{\cdot}007134}$$

Where,

W = Mass of Potassium Iodate taken.

V = Volume of 0·2 (N) $Na_2S_2O_3$ solution.

Note : The highest and lowest value of the normality/factor should not differ in above three determinations by more than 3 units in the fourth decimal place. Otherwise, the standardisation shall be repeated.

For Navancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

Detailed procedure for estimation of NC, cloth & carbamite

Ref: Appendix I of ERDL/P/PS/110

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3.1. Nitrocellulose and cloth :

Weigh 3 ± 0.1 g of prepared sample in a clean G3 grade sintered glass crucible. Extract for 15 to 20 h with pure ethyl ether in a modified Wiley-type extraction apparatus in a 500 ml Iodine flask as the extraction vessel.

After extraction, the insoluble residue left in the crucible is dried in water jacketted oven for 2 h at 90° C and weighed to give a combined amount of nitrocellulose and cloth (W_1 g).

In order to separate cloth from NC the residue is transferred quantitatively to 250 ml conical flask containing about 150 ml distillled acetone. Shake the contents of the flask for 30 min and allow to stand for 5 - 10 min till the cloth pieces/fibres settle down. The supernant NC solution is then filtered through the same crucible using mild suction. The process of washing with acetone is repeated twice using fresh instalments of 100 and 50 ml each. Finally cloth fibres/pieces are quantitatively transferred to the crucible using more quantity of acetone. The content of the crucible is dried at 103 to 105° C and weighed to give the amount of cloth in the sample (W_2 g)

Nitrocellulose and cloth content of coated sheet is calculated on the material free from volatile matter as follow

$$\% \text{ Cloth} = \frac{W2 \times 100 \times 100}{\text{Wt. of sample} \times (100 - \% \text{ V.M})}$$

$$\% \text{ Nitrocellulose} = \frac{(W1 - W2) \times 100 \times 100}{\text{Wt. of sample} \times (100 - \% \text{ V.M})}$$

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

CALCULATION

$$\text{Percent, Carbamite (Centralite)} = \frac{(V_2 - V_1) \times F \times 0.01342}{W} \quad \times 100 \times \frac{100}{100 - M}$$

Where,

1 ml of 0·2 (N) Sodium Thiosulphate = 0·01342 g Carbamite (Centralite).

M = Percent Moisture-/Volatile matter.

W = Mass of the ~~propellant~~ sample taken for extraction.

F = Factor of 0·2 (N) Sodium Thiosulphate solution.

NOTES :— 1. It is important to ensure that at no stage before the end point Sodium Thiosulphate is present in excess in any part of the flask, otherwise it will be decomposed in strongly acid medium.

2. Care must be taken to ensure that all the Methyl Alcohol is removed, otherwis Carbamite (Centralite) estimation will be affected.

3. The method of preparation of solutions and their standardisation shall be carried out as mentioned in method Nos 806, 807, 808.

4. The determination can also be carried out by solvent extraction of propellant, removal of solvent, making the extract to dryness and dissolve the dried residue of the extraction in Carbon Tetrachloride and proceed as above from para 209·2·1.

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR HARI
Executive Director

(10)

STANDARD 0·2 (N) POTASSIUM BROMATE-BROMIDE SOLUTION

Take about 8 g of Potassium Bromate GR/AnalaR in a weighing bottle and heat for 1 hour in an air oven at 130°C. Allow to cool in a desiccator. Weighout accurately by transfer technique a quantity of 5·568 g of above dried Potassium Bromate from the weighing bottle to a 1 lit. volumetric flask using a small funnel. Add 30 g of Potassium Bromide GR/AnalaR. Rinse the funnel with distilled water several times transferring the rinsings to the volumetric flask. Dissolve the salt and make up to the mark with distilled water and shake well.

STARCH SOLUTION (INDICATOR)

Make a paste of 1·0 g soluble Starch with little distilled water. Pour the paste with constant stirring in to 100 ml of boiling distilled water and further boil for 1 minute. Allow the solution to cool and add 2-3 g of Potassium Iodide. The addition of 5 mg of Mercuric Iodide will preserve the solution for several months. Keep the solution in stoppered bottle.

Only freshly prepared or properly preserved Starch solution shall be used. 2 ml of one percent solution per 100 ml of the solution to be titrated is a satisfactory amount. The same volume of Starch solution shall always be added in titration.

ESTIMATION OF CARBAMITE (CENTRALITE) VOLUMETRIC METHOD

APPARATUS

(*a*) Iodine Flask with B-24 ground glass stopper capacity 500 ml corning (R) or equivalent

(*b*) Burette capacity 50 ml class A corning (R) or equivalent.

(*c*) Pipette capacity 50 ml class A corning (R) or equivalent.

(*d*) Measuring Cylinders capacity 10 ml, 25 ml, and 50 ml.

(*e*) Water Bath.

Add 50 ml Carbontetra Chloride GR/AnalaR and then 50 ml of 0·2 (N) aqueous solution of Potassium Bromate containing Potassium Bromide by means of burette. Enclose the flask in a light proof bag during the subsequent bromination of the Carbamite/Centralite. Add 10 ml of concentrated Hydrochloric Acid to the flask replace the stopper at once and shake vigorously for 5 minutes and keep in dark for 10 minutes. Add 20 ml of 15% Potassium Iodide solution (W/V) by pouring it round the stopper a little at a time and easing the stopper gently so as to admit the solution without loosing Bromine. Shake the flask again vigorously, remove the flask from the light proof bag and titrate the liberated Iodine with 0·2 (N) standard Sodium Thiosulphate, shaking the flask continuously during titration. The end point is reached when last drop of Sodium Thiosulphate solution added causes the Carbon Tetrachloride layer to turn from pale pink to colourless. The flask should be stoppered, inverted and held upto the light to observe the end point. Read the volume (V_1) of Thiosulphate solution consumed. Similarly estimate Carbamite (Centralite) on duplicate sample following above procedure.

Simultaneously, carryout blank using same volumes of all reagents added in the same order, omitting only propellant extract. Note the volume of Thiosulphate solution consumed (V_2). Calculate Carbamite (Centralite) content as follows :

For Travancore Precision Components

ARUN KUMAR HARI
Executive Director

TELEX : 0145-7608
FAX : 020-588 1316

Govt. of India, Ministry of Defence
Defence Research & Development Orgn.
HIGH ENERGY MATERIALS RES. LAB.
Sutarwadi, PUNE - 411 021
Date 4th June 1999

(11)

B | F
148A/0133

To

The Controller
Controllerate of Quality Assurance (ME.),
Aundh Road, Khadki,
PUNE - 411 003

SUB : NC COATED CAMBRIC DISCS

REF : Specification No. ERDL/P/PS/110 (PROV.)

Following amendment may please be carried out in the Specn. No. ERDL/P/PS/110 (PROV.) for Coated Cambric Sheet.

Against Volatile matter (% max.) under para 7(a) of the Specn. read "4" instead of "2.5".

o/c

(G.D. MURTHY)
SCIENTIST 'E'
for DIRECTOR, HEMRL

Copy to :

1 The Controller
Controllerate of Quality Assurance (Amn.),
Khadki,
PUNE - 411 003

2 The Senior Quality Assurance Officer,
Senior Quality Assurance Estt (ME)
ARUVANKADU - 643 202.

3. The General Manager,
Cordite Factory,
ARUVANKADU - 643 202.

By Fax

4. The General Manager,
Ordnance Factory,
Khamaria,
JABALPUR.-482 005.

5. The Officer-in-Charge
HEMRL Dett.
ARUVANKADU - 643 202.

6 NOO
G.D./G.P. Div

For Travancore Precision Components Pvt. Ltd

ARUN KUMAR HARI
Executive Director

(12)

(5)

(10)

TELE : ASSURMIL
PHONE : 319641

Controllerate of Quality Assurance (Misc Explosives)
Kirkee Pune-411 003.

No.CQA(ME)/7204/228 Dt. 06 AUG 96

To

B/F
18

The Director
HEMRL, SUTARWADI
PUNE-411021

SUB: FOR SPECIFICATION

Ref: Your Fax No.HEMRL/CCC/6323-B/13 dt. 01-8-96.

The specification JSS 1-69-02 has been superseded by IS:5088 - for your information please.

(AV SAWAKHANDE)
SSO I
for CONTROLLER

160
12 AUG 1996

For Travancore Precision Components Pvt. Ltd.

ARUN KUMAR MARU
Executive Director