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IND/ME/970:2016

ALUMINIUM STEARATE

FOR

155 MM CHARGE 8 AND CHARGE 9

(DS CAT No. 6810 – 001 132)

O Thangiah 6/3/16

सत्यमेव जयते

गुणता से विश्वास

CONTROLLERATE OF QUALITY ASSURANCE (MILITARY EXPLOSIVES)

AUNDH ROAD, PUNE - 411 020

DEPARTMENT OF DEFENCE PRODUCTION

MINISTRY OF DEFENCE

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AMENDMENT RECORD

Amendment		Authority letter	Clauses Affected	Remarks
D.C. No.	DATE			

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THIS SPECIFICATION OR ANY OTHER PATTERN, DRAWINGS OR ANY OTHER INFORMATION ISSUED IN CONNECTION THEREWITH MAY ONLY BE USED FOR A SPECIFIC ORDER PLACED BY THE COMPETENT AUTHORITY. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE WHATSOEVER WITHOUT THE EXPRESS WRITTEN SANCTION OF THE DIRECTOR GENERAL OF QUALITY ASSURANCE, MINISTRY OF DEFENCE, NEW DELHI - 110 011.

0. FOREWORD

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

0.2 This specification is a revision of IND/ME/970 (Prov) and supersedes the same.

0.3 For additional copies or any other enquiry regarding this specification, reference should be made to the Quality Assurance Authority i. e. CQA (ME) Aundh Road, Pune - 411 020.

1. SCOPE

1.1 This specification is meant to govern manufacture, supply and Quality Assurance of Aluminium Stearate.

1.2 The material is suitable for use in the manufacture of Charge 8 & Charge 9 of 155 mm Ammunition.

2. RELATED SPECIFICATION AND DOCUMENTS

2.1 The related documents as mentioned in clause 2.2 are those applicable at the date of publication, of this specification. It is manufacturer's/contractor's responsibility to confirm their current applicability and to obtain from CQA (ME) Aundh Road, Pune - 411 020 information concerning any change that may be necessary due to cancellation, replacement or supersession of any of these documents.

2.2 The following related specifications have been referred to in preparation of this specification.

i)	IS 138 – 1992, Amnd-1 Reaffirmed 2009	---	Paint Ready mixed Marking for packages and petrol containers.
ii)	JSG 0112 : 2015 (Rev No. 2)	---	General Methods of Tests and Assessment of impurities

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

SPECIFICATION		SOURCE OF SUPPLY
(i) IND/ME/ Specification		C. Q. A. (ME), AUNDH ROAD, PUNE - 411 020.
(ii) IS Specification	:	Bureau of Indian Standards, Manak Bhawan 9, Bahadur Shah Zafar Marg, NEW DELHI – 110 002 or Their regional / Branch offices
(iii) JSG / 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 Aluminium Stearate shall be in the form of white powder free from visible impurities, foreign matter and other mechanical contaminations.

4. MANUFACTURE

4.1 The Aluminium stearate shall be manufactured by a process which has received Authoritative approval. The Quality Assurance Authority shall be informed regarding the process used and shall be informed with prior notification of any proposed deviation therefrom. All deviations from the approved process, however, slight, shall be recorded immediately and all the material affected shall be set aside pending the decision of the Quality Assurance Authority.

5. TENDER SAMPLE

5.1 The Contractor/Manufacturer shall submit a tender sample of 250 g in duplicate free of charge and conforming to the specification.

6. QUALITY ASSURANCE

6.1 INSPECTION

6.1.1. The Aluminium Stearate and the packages in which it is contained shall be subject to Quality Assurance by and to the approval of Quality Assurance Officer/Quality Assurance Authority

6.1.2 Samples of the material and of the packages in which it is contained may be taken from any portion of the batch/lot/consignment.

6.1.3 If on examination, any sample be found not to conform to this specification, the whole batch/lot/consignment shall be rejected.

6.1.4 The foregoing provisions shall equally apply to the prime contractors and sub contractors, if any.

6.2. SAMPLING

6.2.1 The representative sample of 250 g each shall be taken from each package from the batch/lot/consignment. The number of samples to be drawn from the lot shall be as given below :-

Lot Size	No. of containers to be selected
3 to 50	3
51 to 200	4
201 to 400	5
401 to 650	6
651 and over	7

6.3 TEST REQUIREMETS

6.3.1 The samples drawn from any portion of the supply shall comply with the clause 3.1 above and in addition shall satisfy the following test requirements.

Sl. No.	Test	Passing Standard	Test Method
1.	Visual examination	White powder free from visible impurities, foreign matter other mechanical contaminations	
2.	Melting point degree C Min Max	 165 175	Appendix 'A'
3.	Moisture content, Percent by mass Max	1. 5	Appendix 'B'
4.	Mineral acidity as H_2SO_4% Max	0.02	Appendix 'C'
5.	Aluminium Content, Percent by mass Min Max	 4.8 5.1	Appendix 'D'
6.	Alcohol soluble matter, Percent by mass Max	4.0	Appendix 'E'
7.	Specific surface cm^2/cm^3 Min	25000	By Karl Fischer Sub sieve sizer
8.	Sieving		
	a) Retention on 150 micrometre IS Sieve Max	5. 0	JSG 0112 Method No. 18
	b) Retention on 75 micrometre IS Sieve Max	15	

7. SUPPLIER'S INSPECTION OF STORES/CONSIGNMENT

7.1 Before tendering the store for inspection, the supplier shall carry out a thorough inspection of each delivery to satisfy himself that the store fully conforms to this specification and shall render a certificate to that effect to the QA Officer/QA Authority.

8. WARRANTY

8.1 The store supplied against the contract shall deem to have been warranted against defective material and performance by the manufacturer/contractor for a period of 12 months from the date of receipt of the store at the consignee's end and if during this period any of the store supplied is found defective, the same shall be replaced by the manufacturer/contractor free of charge at the consignee's premises.

9. PACKAGING

9.1 The material shall be initially packed in two polythene bags hermetically sealed (film thickness 0.08 mm) followed by outer cover of dosooti bag properly closed and firmly packed in HDPE bag. The quantity per package shall not be more than 30 Kg.

10. MARKING

10.1 All the packages containing the material shall be durably and legibly marked with the following details :-

i) Nomenclature and specification number

ii) Name and address of the consignee.

iii) A/T No. or S. O. No. & date.

iv) Consignment No

v) Lot/Batch No. & Date of manufacture

vi) Gross & Net Mass.

vii) Consecutive no of package and total No. of packages in the consignment

viii) Date of Supply.

ix) Contractor's initials or recognised trade mark.

10.2 In addition to above the QA Officer/QA Authority may suggest some more marking/Identification suitable at the time of inspection.

10.3 The paint used for marking shall conform to IS 138 (Latest Issue).

11. DEFENCE STORES CATALOGUE NUMBER

11.1 The Defence stores catalogue number allotted to this store is 6810 – 001 132.

12. SUGGESTIONS FOR IMPROVEMENT

12.1 Any suggestion for improvement in this document shall be forwarded to The Controller, CQA (ME) Aundh Road, Pune – 411 020.

Date :

(Mrs. MGP DHANRAJ)
CONTROLLER
CQA(ME), Aundh Road
Pune - 411 020

13. APPENDICES

APPENDIX 'A'

DETERMINATION OF MELTING POINT

Dry the required amount of material in a glass dish for 16 hours in a desiccator over sulphuric acid. Fill the capillary tube closed at one end with the dried material to a depth of 5 mm. Compacting the sample with tapping. Fasten the tube to the standardised thermometer conforming to the following essential specifications shall be used where range is 150 to 200 degree celsius with subdivision 0.5 degree celsius gradation, so that the lower end of the tube is in contact with the bulb of the thermometer. Suspend the thermometer in aliquid paraffin bath. Start the stirring & heat the bath rapidly to about 15 degree C below the prescribed melting point, then adjust the heat source so that the rise in temp does not exceed 1 degree C per minute. Observe & record the temperature at which material in the tube first appears to become completely liquified.

APPENDIX 'B'

DETERMINATION OF MOISTURE CONTENT

Weigh accurately about 1 g of the material (M) in a squat type glass weighing bottle 50 mm in diameter and 25 mm in height fitted with ground glass stopper. Remove the stopper & place both the stopper and bottle separately in an air oven maintained at 105 degree C plus minus 2 degree C. After 3 hours of heating, replace the stopper in the bottle while still in the oven and then remove and cool in a desiccator. Remove and replace the stopper quickly to equalise pressure, calculate the loss in mass as percentage of the mass of the material taken for test.

APPENDIX 'C'

DETERMINATION OF MINERAL ACIDITY

Weigh about 5 g of the material and add 10 ml of rectified spirit shake vigorously with 90 ml of freshly boiled cooled distilled water. Filter and make up the volume to 250 ml. Take aliquot portion of this solution & titrate with N/10 sodium hydroxide solution using methyl orange as indicator. Carry out blank.

$$\text{Acidity as } H_2SO_4, \text{ Percent by mass} = \frac{(B - E) \times 100 \times 0.0049}{\text{Mass of the sample}}$$

WHERE B = ml of NaOH required for the blank.

E = ml of NaOH required for the sample.

APPENDIX 'D'

DETERMINATION OF ALUMINIUM CONTENT

Weigh accurately 1 g of the material in silica dish and ignite at a dull red heat until all carbonaceous matter has been burnt off. Cool and then fuse with requisite amount of sodium bisulphate in order to render the whole ash soluble in dilute hydrochloric acid (5N). Dissolve the melt in dilute hydrochloric acid, filter and wash the residue on the filter paper thoroughly with distilled water. Add 5 g of Ammonium chloride and 2 drops of cncentratd Nitric acid to the filtrate and washings, heat to boiling and add dilute Ammonium hydroxide 4N, drop by drop until the solution smells faintly of Ammonia and shows distinct yellow colour on the addition of two drops of methyl red indicator. Boil for two minutes, filter immediately through a suitable filter paper (Whatman No. 41) and wash the residue with hot 2% solution of ammonium nitrate till the filtrate is free from chlorides. Dry the residue ignite to constant mass at 1000 degree C to 1200 degree C in a tared porcelain or silica crucible.

$$\text{Aluminium Content, Percent by mass} = \frac{\text{Mass of the residue x } 53.963 \text{ x } 100}{\text{Mass of the sample x } 101.9612}$$

APPENDIX 'E'

DETERMINATION OF ALCOHOL SOLUBLE MATTER

Take 5 g of the material in 250 ml beaker & dissolve it in 100 ml rectified spirit. Stir thouroughly. Warm if necessary. Cover the beaker with watch glass and allow it to stand for 1 hour at room temperature. Filter into weighed glass evaporating dish (M_1). Wash the filter paper twice with rectified spirit. Collect the washings in the same glass evaporating dish. Evaporte to dryness on a boiling water bath. Dry the residue to constant mass (M_2) in an oven maintained at 100 plus minus 2 degree C.

$$\text{Alcohol soluble matter, Percent by mass} = \frac{(M_2 - M_1) \text{ x } 100}{\text{Mass of the sample taken}}$$

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