



**GOVERNMENT OF INDIA
MINISTRY OF DEFENCE**

JOINT SERVICES SPECIFICATION

ON

STRONTIUM PEROXIDE

(DS Cat No. 6810-001 119)

**JSS 6810-135: 2010
(Revision No. 1)**

**DIRECTORATE OF STANDARDISATION
DEPARTMENT OF DEFENCE PRODUCTION
MINISTRY OF DEFENCE
'H' BLOCK, NIRMAN BHAWAN PO
NEW DELHI - 110 011**

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**LIST OF MEMBERS ASSOCIATED WITH ARMAMENT STANDARDISATION
SUB COMMITTEE**

1. This Joint Services Specification has been approved by Dr. SN Asthana, Director, Directorate of Armaments (R&D), and Chairman Armament Standardisation Sub Committee by circulation.
2. The following members were present/consulted in approving the document: -

Sl No.	Name & Designation	Organisation
1.	Shri AC Jain, Addl. Director	Dte of Armaments, DRDO Orgn, New Delhi
2.	Col SK Mohan	ADGWE/GS (WE-2/3), New Delhi
3.	Col RN Nambiar	Dte of Arty (GS/Artillery-5), New Delhi
4.	Shri B.P. Singh, DON	Dte Gen of Naval Armt, Naval HQ, New Delhi
5	Air Cmde R Kumar, PDA	Dte of Armt & Safety Eqpt, Air HQ, New Delhi
6.	Col Sunil Bhatia	DGEME, Army HQ, New Delhi
7.	Capt VP Varghese	DGNAI, Naval HQ, New Delhi
8.	Shri Yogesh Kumar, SSO – II	DGAQA, DD (Armt) Gp, New Delhi
9.	Shri KL. Tripathi P.Sc.O Deputy Controller	CQA (ME), Pune
10	Col JS Lotay, Jt Controller	CQA (Amn), Pune
11.	Lt Col Y.C Panday	CQA (SA), Ichapur, West Bengal
12.	Col A.N. Mathur	CQA (W), Jabalpur
13.	Shri SC Aglawe, Sc ‘F’	HEMRL, DRDO, Pune
14.	Shri GC Adhikari, Sc ‘F’	ARDE/DRDO Orgn, Pune
15.	Shri Shrish Kumar Jt. General Manager	Ammunition Factory, Pune
16.	Shri S K Saxena, NSO	Secretary ASSC

RECORD OF AMENDMENTS

Amendment		Amendment pertains to SI. No./ Para No./ Column No.	Authority	<u>Amended by</u> Name & Appointment (IN BLOCK LETTERS)	Signature & Date
No.	Date				

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0. FOREWORD

0.1 This Joint Services Specification has been prepared by the Armament Standardisation Sub Committee on the authority of the Standardisation Committee, Ministry of Defence.

0.2 This specification has been approved by the Ministry of Defence and is mandatory for use by the Defence Services.

0.3 This specification is a revision of JSS 6810 - 135 : 2001 and supersedes the same.

0.4 This specification is meant to govern supply and quality assurance of Strontium peroxide.

0.5 Quality Assurance Authority for the item covered by this specification is The Controller, Controllerate of Quality Assurance (Military Explosives), Aundh Road, Kirkee, Pune - 411 020. Enquiries regarding this specification relating to any contractual conditions should be addressed to the Quality Assurance Authority named in the tender or contract. Other enquiries should be referred to:-

The Director,
Directorate of Standardisation,
Ministry of Defence,
'H' Block, Nirman Bhawan PO,
New Delhi - 110 011.

0.6 Copies of this specification can be obtained on payment from:-

The Director,
Directorate of Standardisation
Standardisation Documents Centre,
Ministry of Defence
Room No. 5, 'J' Block
Nirman Bhawan, PO New Delhi - 110 011.

0.7 This specification holds good only for the supply order for which it is issued.

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1. SCOPE

1.1 This specification is meant to govern supply and quality assurance of Strontium peroxide suitable for use as an ingredient of pyrotechnic compositions.

2. RELATED SPECIFICATIONS/DOCUMENT

2.1 Reference is made in this specification to:-

IS 138 : 1992	Ready Mixed Paint, Marking, for Packages and Petrol Containers - Specification (Third Revision) Reaffirmed 2004, Amds 1
IS 460 (Part 1) : 1985	Specification for test sieves: Part I Wire cloth test sieves (Third Revision) Reaffirmed 2004, Amds 1
JSG 0112 : 1997 (Revision No. 1)	General methods of tests and assessment of impurities in Chemicals/Materials used in the manufacture of explosives and ammunition

2.2 Copies of Indian Standards are obtainable on payment from :-

Bureau of Indian Standards,
Manak Bhavan,
9, Bahadur Shah Zafar Marg,
New Delhi – 110002

or

their regional/branch offices

2.3 Copies of the Joint Services Guide are obtainable on payment from :-

The Director,
Directorate of Standardisation
Standardisation Documents Centre,
Ministry of Defence
Room No. 5, 'J' Block
Nirman Bhawan, PO New Delhi - 110 011.

3. DESCRIPTION

3.1 The material shall consist essentially of anhydrous Strontium peroxide (SrO_2) in the form of a clean white powder free from grit, foreign matter and visible impurities the material shall comply with the sieving requirements given in clause 6 below or with such other requirements as may be specified under the terms of the contract .

4. TENDER SAMPLE

4.1 The manufacturer/supplier/contractor shall submit a tender sample of 125 g, essentially from the same batch/lot of manufacture, free of all charge and conforming to this specification, when called for in the tender.

5. PRE-INSPECTION OF STORES/CONSIGNMENT

5.1 Manufacturers/contractors must satisfy themselves that the stores are in accordance with the terms of contract and fully conform to the required specification, by carrying out a thorough pre-inspection of each lot before actually tendering the same for inspection to the Quality Assurance Officer nominated under the terms of the contract. A declaration by the contractor that a necessary pre-inspection has been carried out on the stores tendered will be submitted alongwith the challan. The showing the features checked/tested and will have the test certificated attached to the challan/declaration.

5.2 If the Quality Assurance Officer finds that the pre-inspection of the consignment as required above has not been carried out, the consignment is liable for rejection.

6. QUALITY ASSURANCE

6.1 Inspection

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

6.1.2 Sample of the material and of the packages may be taken from any portion of a consignment.

6.2 Sampling

6.2.1 A representative sample of 250 g shall be drawn from each container. Normally the number of containers to be selected at random from a batch/lot shall depend on the size of batch/lot and shall be in accordance with the following table.

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<u>No of containers in a batch/lot</u>	<u>No. of containers to be sampled</u>
Up to 25	3
26 to 50	4
51 to 100	5
101 to 150	6
151 to 300	7
301 to 500	8
501 and above	10

6.3 Criteria for conformity

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

6.3.2 The foregoing provisions shall apply equally to prime contractors and to any sub-contractor.

6.4 Test Requirements

6.4.1 Samples from any portion of batch/lot/consignment shall be in accordance with the clause 3 above and shall comply with the following test requirements.

TEST REQUIREMENTS OF STRONTIUM PEROXIDE

<u>SI No.</u>	<u>Characteristics</u>	<u>Passing Standard</u>	<u>Test method</u>
1	2	3	4
(i)	Moisture (24 hours in vaccum Desiccator), percent by mass	Max 1.0.	JSG 0112 Method 1 (b)
(ii)	Total matter insoluble in 10 per cent Hydrochloric acid, percent by mass	Max 1.0	JSG 0112 Method 4 (with 10% HCl)

(iii)	Organic matter insoluble in 10 percent Hydrochloric acid, percent by mass	Max 0.1	JSG 0112 Method 4 (with 10% HCl)
(iv)	Grit:- Aqua regia insoluble matter after ashing, retained on 63 micrometer IS Sieve.	Nil	JSG 0112 Method 6 & 18
(v)	Total chlorides, calculated as SrCl_2 percent	Max 0.1	JSG 0112 Method 7 (b)
(vi)	Total sulphates, calculated as SrSO_4 percent	Max 0.75	JSG 0112 Method 8
(vii)	Total Iron compounds calculated as Fe_2O_3 percent	Max 0.5	Appendix 'A'
(viii)	Total alkali metal compounds calculated as NaCL percent	Max 1.0	Appendix 'A' or JSG 0112 Method 19
(ix)	Total Strontium calculated as Strontium, percent	Min 65.0	Appendix 'B'
(x)	Total peroxide, calculated as (SrO_2), percent	Min 70.0	Appendix 'C'
(xi)	Sieving :- Material retained on 125 micrometer IS Sieve	Nil	JSG 0112 Method 18

Note : - Particulars of IS Sieves shall conform to IS 460 (Part1)

7. WARRANTY

7.1 The stores supplied against the contract shall be deemed to be warranted against the defective material and performance by the contractor for a period of 12 months from the date of receipt of the stores at the consignee's end and shall retain the properties described above. If during this period any of the stores supplied is found defective, the same shall be replaced by the manufacturer/supplier/contractor free of charges at the consignee's premises.

8. PACKAGING

8.1 The Strontium peroxide shall be supplied in sound, clean and dry hermetically sealed drums or other approved packages containing an approved quantity. The packages shall be painted or unpainted as required by the terms of the contract. Any paint used on the packages shall be of approved quality to the satisfaction of the Quality Assurance Authority.

9. MARKING

9.1 All packages containing the material shall be indelibly and legibly marked with the following details : -

- (i) Nomenclature and specification number of the material
- (ii) Name and address of the consignee.
- (iii) A/T or S.O. number and date.
- (iv) Consignment number.
- (v) Batch No. and date of manufacture
- (vi) Gross and net mass
- (vii) Consecutive number of package and total number of packages in consignment
- (viii) Date of supply
- (ix) Manufacturer's initials or recognized trademark.

9.2 In addition to the above, the Quality Assurance Officer may suggest some more markings/identifications suitable at the time of inspection.

9.3 The paint used for marking should conform to IS 138 and to the satisfaction of the Quality Assurance Officers/Quality Assurance Authority.

10. DEFENCE STORES CATALOGUE NUMBER

10.1 The Defence Stores Catalogue Number allotted to this store is 6810-001 119..

11. SAFETY OF OPERATIONS

11.1 Nothing in this specification shall relive the supplier/contractor of his responsibility for the safety of operations in the manufacture, storage, transit or use of this store.

12. SUGGESTIONS FOR IMPROVEMENT

12.1 Any suggestion for improvement in this document may be forwarded to:-

The Director,
Directorate of Standardisation,
Ministry of Defence,
'H' Block, Nirman Bhawan PO,
New Delhi-110 011.

A. DETERMINATION OF TOTAL IRON COMPOUNDS AND TOTAL ALKALI METAL COMPOUNDS

A.1 Dissolve 5 g sample (M) in 150 ml of 5 percent Hydrochloric acid, boil for 5 minutes and then make alkaline with Ammonia. Warm the solution, filter through a No.41 whatman paper and wash with hot water.

A.2 IRON COMPOUNDS

A.2.1 Wash the above precipitate into a 250 ml beaker with 10 ml of hot 10 percent Hydrochloric acid and a minimum quantity of hot water. Add Stannous chloride solution in slight excess over that required to reduce all the Ferric iron present. Cool, add 5 ml of saturated Mercuric chloride solution and 100 ml of cold water and titrate with N/10 Potassium permagnate solution.

$$\text{Fe}_2\text{O}_3, \text{ percent} = \frac{V \times 0.7984}{M}$$

Where M = Mass of the sample taken in g.

V = N/10 KMnO₄ required for titration in ml

A.3 ALKALI METAL COMPOUNDS

A.3.1 To the filtrate obtained at clause A. 1, add 5g of Ammonium carbonate dissolved in 30 ml of hot water, set aside for 2 hours and filter through a No.40 with Whatman paper. Wash once with water containing a little Ammonia, evaporate the filtrate to 25 ml, wash down the sides of the beaker and add 2 ml of dilute Ammonia, followed by 10 ml of 2 percent Ammonium oxalate solution. Stand overnight, filter through a No.42 Whatman paper into a previously ignited tared silica basin, wash with three successive quantities of 20 ml of water containing a little Ammonia and Ammonium oxalate. Evaporate to dryness carefully and then ignite to remove Ammonium salts. Cool and add 2 ml of concentrated Sulphuric acid from a pipette, washing down all round the sides of the basin. Heat to remove Sulphuric acid and then ignite to constant mass (M₂). Carryout a blank on the materials used in exactly the same manner and apply the necessary correction(M₁). Calculate the mass of residue to percentage alkali metals as Sodium chloride.

$$\text{Sodium chloride percent} = \frac{M_2 - M_1}{M} \times \frac{117 \times 100}{142}$$

Where

M₂ = Mass of residue in g with the sample.

M₁ = Mass of residue in g without sample (blank)

M = Mass of the sample taken in g.

APPENDIX 'B'

B. DETERMINATION OF TOTAL STRONTIUM

B.1 Weigh accurately about 1 g of the sample into a 150 ml beaker and dissolve in the minimum quantity of dilute Hydrochloric acid. Boil the solution, cool and filter through a whatman No. 42 filter paper. Wash well with a distilled water. Dilute the filtrate to 100 ml, boil and add 15 ml of 10% Sulphuric acid. Allow to cool, add 100 ml of methlated spirit and stand overnight. Filter the precipitate on to a previously ignited and weight asbestos padded silica Gooch crucible. Wash with diluted methylated spirit (1 part methylated sprit to 1 part water) containing 1% of Sulphuric acid and finally with neat methylated spirit. Dry, ignite for 15 minutes, cool in a desiccators and take this mass. Calculate the total Strontium as Strontium percent as per the formula given below :-

$$\text{Strontium, percent} = \frac{\text{Mass of SrSO}_4 \times 0.4770 \times 100}{\text{Mass of sample taken in g.}}$$

C. DETERMINATION OF TOTAL PEROXIDE

C.1 Weigh accurately about 0.3 grams of the sample into a 1000 ml beaker. Add 150 ml of water and 25 ml cold 25 % Phosphoric acid. After complete solution of the sample add 400 ml of distilled water 5 to 10 ° C (Chilled) add titrate immediately with 0.1 N Potassium permanganate, stirring gently and without excessive agitation.

$$\text{Strontium peroxide percent} = \frac{V \times 0.00598 \times 100}{M}$$

Where $V = N/10 \text{ KMnO}_4$ required for titration in ml

$M =$ Mass of sample taken in g.

RAKSHA MANTRALAYA/MINISTRY OF DEFENCE
MANKIKARAN NIDESHILAYA/DTE. OF STANDARDISATION

Sheet No. 1/2
No. of Sheets : 2
Authority :

AMENDMENT LIST No : 1

The following amendment are approved :-

JSS No. & Year	Nomenclature	Details of Amendments	Reason for Amendments

1	2	3	4

JSS 6810-135:2010 (Revision No. 1)	Strontium Peroxide	Page No. 3 Clause No. 5 Pre-inspection of Stores/ Consignment Ser No. 5.1	The amendments are suggested by CQA (ME) Pune, vide their letter No. CQA (ME)/5025/STD/71 Dated 12 Jan 2011

FOR : Manufacturers/
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The declaration will also
indicate the method followed
in carrying out pre-inspection
showing the features
checked/tested and will have
the test certificated attached
to the challan/declaration.