GOVERNMENT OF INDIA
MINISTRY OF DEFENCE

JOINT SERVICES SPECIFICATION

ON

POLYVINYL CHLORIDE POWDER, 75 MICRON SIZE IS SIEVE

(DS Cat No. 9330 – 000 071)

JSS 9330 –04: 2010
(Revision No. 1)
(Supersedes JSS 9330 – 04: 1997)

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. BR Gandhe, 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/Artillary-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.	Dr. SN Asthana, Sc 'G'	HEMRL, DRDO, Pune
14.	Shri GC Adhikari, Sc 'F'	ARDE/DRDO Orgn, Pune
15.	Shri Shrish Kumar Jt. General Manager	Ammunition Factory, Pune
16.	Lt Col R K Talwar	Secretary ASSC

RECORD OF AMENDMENTS

Amendment		Amendment pertains to: Sl.No./ Para No./ Column No.	Authority	Amended by	Signature & Date
No.	Date			Name & Appointment (IN BLOCK LETTERS)	

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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 the revision of JSS 9330–04:1997 and supersedes the same.

0.4 This specification would be used to guide, design, manufacture, supply and quality assurance of Polyvinyl chloride Powder, 75 Micron size IS sieve.

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.

1. SCOPE

1.1 This specification is meant to govern manufacture, supply and quality assurance of Polyvinyl chloride Powder, 75 Micron size IS sieve.

1.2 The material is suitable for use as an ingredient in the manufacture of pyrotechnic compositions

2. RELATED SPECIFICATION AND DOCUMENTS

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 4669 : 1968	Methods of test for Polyvinyl chloride resins Reaffirmed 2003, 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 the Indian Standards are obtainable on payment from: -

Bureau of Indian Standards,
Manak Bhawan,
9, Bahadur Shah Zafar Marg,
New Delhi – 110 002

or

Their regional/branch offices.

2.3 Copies of the JSG 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. STANDARD PATTERN

3.1 Standard pattern if held with the purchasing or Quality Assurance Authority may be obtained and shall constitute a general guide only. The stores shall conform to this specification otherwise.

4. MATERIAL

4.1 Materials used for the manufacture of store shall be of the highest grade and shall conform to the latest relevant specifications.

4.2 It shall essentially consist of polymerised vinylchloride without added plasticiser and shall be in the form of white powder free from any visible impurities and foreign matter.

5. MANUFACTURE

5.1 Polyvinyl chloride Powder, size 75 Micrometre IS Sieve shall be manufactured by a process, which will produce the product conforming to this specification.

6. TENDER SAMPLE

6.1 The manufacturer/supplier/contractor shall submit two tender samples each of 250 g essentially from the same batch/lot of manufacture free of all charges and conforming to this specification, to the Quality Assurance Authority/Quality Assurance Officer as stated in the contract.

7. PRE-INSPECTION OF STORES/CONSIGNMENT

7.1 Manufacturers/contractors must satisfy themselves that the stores are in accordance with the terms of the 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 along with the challan. The declaration will also indicate the method followed in carrying out pre-inspection showing the features checked/tested and will have the test certificate attached to the challan/declaration.

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

8. QUALITY ASSURANCE

8.1 The contractor shall extend to the Quality Assurance Authority or his authorised representative, free of all cost, all reasonable facilities for inspection and testing of stores for satisfying themselves that the stores are manufactured in accordance with this specification and for this purpose, shall have free access to the contractors or sub-contractors premises at all times during the run of the contract. The contractor shall notify to the Quality assurance Authority of all sub contracts placed by him and provide inspection facilities for all stores so sub contracted.

8.2 Inspection

8.2.1 Polyvinyl chloride Powder and the packages in which it is packed shall be subject to inspection and to the final approval of the Quality Assurance Officer/Quality Assurance Authority.

8.2.2 Samples of the material and of the packages may be taken from any portion of the batch/lot/consignment.

8.3 Sampling

8.3.1 The representative sample of 250 g shall be taken from each package selected for sampling from the batch/lot. However the number of samples to be drawn from each batch/lot shall be at the discretion of the Quality Assurance Officer.

8.4. Criteria for Conformity

8.4.1 If on examination, any sample is found not conforming to this specification, the whole batch/lot/consignment may be rejected.

8.5. Test Requirements

8.5.1 Samples taken from any portion of the batch/lot/consignment of material shall conform to clause 3 and in addition shall conform to the test requirements shown as under :-

TEST REQUIREMENTS OF POLYVINYL CHLORIDE POWDER 75 MICRON IS SIEVE

Sl. No.	Characteristics	Passing Standard	Test Method
(1)	(2)	(3)	(4)
(i)	Volatile Matter content at 104 to 106°C, per cent by mass	Max 0.5	Method No. 1 (a) JSG 0112
(ii)	Sulphated Ash, per cent by mass	Max 0.2	Method No. 11 of IS 4669
(iii)	Water soluble matter, per cent by mass	Max 0.2	Appendix 'A'
(iv)	Acidity (a) To Methyl orange (b) To Phenolphthalein as HCL, per cent by mass	 Nil Max 0.05	Appendix 'B'
(v)	Alkalinity (a) To Methyl orange as sodium carbonate per cent by mass (b) To Phenolphthalein	Max 0.05 Nil	Appendix 'B'
(vi)	Total Chlorine as Chloride-ion per cent by mass	Min 53	Appendix 'C'
(vii)	Viscosity Number	Min 115	Method No. 8 of IS 4669
(viii)	Bulk density, g/cm^3	Min 0.40	Appendix 'D'
(ix)	Retention on 75 micron IS Sieve	Nil	Method No. 18 of JSG 0112

9. WARRANTY

9.1 The stores supplied shall bear a warranty as per contract. In absence of such clause the following clause shall apply : -

9.2 The stores supplied against the specification shall be deemed to be warranted against 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 if during this period any of the stores supplied is found defective, the same shall be replaced by the manufacturer, supplier or contractor free of all charges at the consignee's premises but not later than 3 months from the date of receipt of such information.

10. PACKAGING

10.1 The stores shall be securely packed to avoid damages in transit so as to reach in perfect, serviceable and fit condition to the consignee. The packages shall be legibly marked with the consignee's address and other necessary details for easy identification of the stores by consignee.

10.2 The Polyvinyl Chloride powder shall be supplied in sound and dry packages, consisting of polythene film of 0.13 mm thick and external bag made up of Kraft paper of capacity 25 kg. The packages shall be securely closed.

10.3 The material offered in any other packages shall have the prior approval of the Quality Assurance Officer.

10.4 Inclusion of any foreign matter or impurities in any of the packages shall render the whole consignment liable for rejection.

11. MARKING

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

(i) Nomenclature of the store and specification number

(ii) Name and address of the consignee.

(iii) A.T. or S.O. No. and date.

(iv) Consignment No.

(v) Lot/Batch No. and date of manufacture.

(vi) Gross and 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

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

11.3 The paint used for marking shall conform to IS 138.

12. SAFETY OF OPERATIONS

12.1 Nothing in this specification shall relieve the manufacturer/supplier/contractor/user of his responsibility for the safety of operations in manufacture, storage, transit or use of the store.

13. DEFENCE STORES CATALOGUE NUMBER

13.1 The Defence Stores Catalogue Number allotted to this store is 9330-000 071.

14. SUGGESTIONS FOR IMPROVEMENT

14.1 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.

APPENDIX 'A'

A. DETERMINATION OF WATER SOLUBLE MATTER

A.1 Transfer about 20 g of the sample, accurately weighed (M_1), to a clean, dry 500 ml beaker and moisten it with 10 ml of denatured spirit (industrial methylated spirit may be used). Add 200 ml of previously boiled and cooled distilled water and boil gently for 10 minutes taking care to avoid bumping and then cool to room temperature. Allow the solid matter to settle and then filter. Collect the filtrate and washings in a standard volumetric flask and make up the volume to 250 ml. Evaporate 50 ml of the filtrate in a clean dry and tared porcelain-evaporating dish (M_2). Further dry the dish with the residue in an oven at 100 to 105° C, cool in a desiccator to room temperature and reweigh (M_3). Remaining filtrate in the volumetric flask can be stored for Acidity and Alkalinity determination.

A.2 Calculation

$$\text{Water soluble matter, percent by mass} = \frac{M_3 - M_2}{M_1} \times 500$$

APPENDIX 'B'

B. DETERMINATION OF ACIDITY AND ALKALINITY

B.1 Transfer 50 ml of the filtrate from 250 ml volumetric flask from Appendix 'A' to a clean, dry 250 ml conical flask and titrate with 0.1 N Hydrochloric acid or 0.1 N Sodium hydroxide solution as appropriate using Methyl Orange as an indicator.

B.2 Transfer another 50 ml of the filtrate from 250 ml volumetric flask from Appendix 'A' to another clean and dry 250 ml conical flask and titrate with 0.1 N Hydrochloric acid or Sodium hydroxide as appropriate using Phenolphthalein as an indicator.

B.3 Carry out a blank determination on distilled water used and applies necessary correction.

B.4 Calculation

i) Acidity as Hydrochloric acid per cent by mass

$$= \frac{(t_1 - t_2) \times f \times 0.00365}{M_1} \times 500$$

ii) Alkalinity as Sodium carbonate percent by mass

$$= \frac{(t_3 - t_4) \times f_1 \times 0.0053}{M_1} \times 500$$

Where,

f = Factor of 0.1 N Hydrochloric acid

f_1 = Factor of 0.1 N Sodium hydroxide

t_1 = ml of 0.1 N Sodium hydroxide required for sample

t_2 = ml of 0.1 N Sodium hydroxide required for blank

t_3 = ml of 0.1 N Hydrochloric acid required for sample

t_4 = ml of 0.1 N Hydrochloric acid required for blank.

APPENDIX 'C'

C. DETERMINATION OF CHLORINE AS CHLORIDE-ION CONTENT

C.1 Transfer about 0.2 g of the sample, accurately weighed (M), to a clean and dry nickel crucible. Add 5 g of fusion mixture (Sodium carbonate and Potassium carbonate 1: 1) and fuse the sample on the Bunsen burner. Cool and dissolve the fused material in about 100 ml distilled water and boil again. Cool and add slight excess Nitric acid (10%) to decompose Carbonates. Boil, cool and add 50 ml of 0.1 N Silver nitrate solution and titrate with 0.1 N Potassium thiocynate solution using 5 ml of Ferric alum as indicator (t_1).

C.2 Carry out blank determination (t_2)

C.3 Calculation

$$\text{Total Chlorine as Chloride ion per cent by mass} = \frac{(t_2 - t_1) \times f \times 0.3546}{M}$$

Where, f = Factor of 0.1 N potassium thiocynate solution

APPENDIX 'D'

D. DETERMINATION OF BULK DENSITY

D.1 Transfer 5 g of the sample, accurately weighed, into a clean, dry stoppered cylinder of 150 mm height and 20 mm dia and graduated into half ml. Drop the Cylinder vertically 30 times from a height of 65 mm on to a piece of hard leather. Level off the surface of the material with minimum side tapping.

D.2 Calculation

$$\text{Bulk Density} = \frac{\text{Mass}}{\text{Volume}}$$

Note: The procedure is conveniently arranged by sliding the cylinder through two wooden filter stands clamped one above the other on the same support. The lower ring being arranged so as to limit the travel of the cylinder to 65 mm.