



भारत सरकार
GOVERNMENT OF INDIA

रक्षा मंत्रालय
MINISTRY OF DEFENCE

संयुक्त सेवा विनिर्देश
JOINT SERVICES SPECIFICATION

ON

PARAFFIN LIQUID, GRADE I, FOR AMMUNITION
(DS Cat. No. 9160-000 016)

Issued by

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RECORD OF AMENDMENTS

<i>Amendment</i>		<i>Amendment pertains to :</i> <i>S No./Para No./</i> <i>Column No.</i>	<i>Authority</i>	<i>Amended by</i>	<i>Signature</i> <i>&</i> <i>Date</i>
<i>No.</i>	<i>Date</i>			<i>Name & Appointment</i> (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 JSS 9160-05 : 2016, (Revision No. 3).

a) was revised in the year 2001.

b) is a revision of JSS 9160-05 : 2010, (Revision No. 2) and supersedes the same.

0.4 This specification would be used for Manufacture, Supply and Quality Assurance of Paraffin Liquid, Grade I, for Ammunition.

0.5 Quality Assurance Authority for the item covered by this specification is the Controller, Controllerate of Quality Assurance (Military Explosives), Aundh Road, Pune-411 020. Enquiries regarding technical parameters shall be addressed to the Quality Assurance Authority, while other enquiries shall be referred to:

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

0.6 Non registered users can obtain the following on payment:

(a) Copies of IS from:

Bureau of Indian standards,
Manak Bhawan,
9, Bahadur Shah Zafar Marg,
New Delhi-110 002

or

Their regional/Branch offices.

(b) Copies of JSSs/JSGs from:

The Director,
Directorate of Standardisation
Standardisation Documents Centre,
Ministry of Defence, Room No. 05,
'J'-Block, Nirman Bhawan PO,
New Delhi-110 011

JSS 9160-05 : 2016
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0.7 Indian Standard (IS) specifications are available free of cost for registered users on:

Directorate of Standardisation Website

www.ddpdos.gov.in

For registration visit our website.

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

0.9 Directorate of Standardisation Website: All the approved JSSs/JSGs are available on the Directorate of Standardisation Website **www.ddpdos.gov.in**. Defence Organisations desirous of accessing a copy of this document are requested to approach the Directorate of Standardisation for obtaining user id/password to access the website.

1 SCOPE

1.1 This specification is meant to govern Manufacture, Supply and Quality Assurance of Paraffin Liquid, Grade I, for Ammunition suitable for used as ingredient in the manufacture of various ammunition stores.

1.2 The material is suitable for use as an ingredient of Plastic Explosives (PE) oil used in the manufacture of Plastic Explosives Kirkee-I (PEK-I)

1.3 The material is used as an ingredient of Lubricating composition used in pellet pressing machines.

1.4 The material is used for separation of Nitroglycerine (NG) from spent acids in the manufacture of Nitroglycerine (Biazzi process).

2 RELATED SPECIFICATIONS/DOCUMENTS

2.1 Reference is made in this specification to:

<i>S No.</i>	<i>Specification No. & Year</i>	<i>Nomenclature</i>
a)	IS 138 : 1992 (Third Revision) Reaffirmed 2014 AMD 1	Ready Mixed Paint, Marking, for Packages and Petrol Containers-Specification.
b)	IS 1448 (Part 4) : 2008 (Second Revision) Reaffirmed 2013	Methods of Test for Petroleum and its Products - Part 4 : Petroleum Products-Determination of Ash.
c)	IS 1448 (Part 21) : 2012 (Third Revision)	Petroleum and its Products-Methods of Test - Part 21 : Flash Point (closed) by Pensky Martens Apparatus.
d)	IS 1448 (Part 25) : 1976 (First Revision) Reaffirmed 2013	Methods of Test for Petroleum and its Products - Part 25 : Determination of Kinematic and Dynamic Viscosity.
e)	IS 1448 (Part 32) : 1992 (Second Revision) Reaffirmed 2013	Methods of Test for Petroleum and its Products : Part 32 Density and Relative Density.
f)	IS 1448 (Part 43) : 1991 (Second Revision) Reaffirmed 2013	Methods of Test for Petroleum and its Products - Part 43 : Bromine Number by Colour Indicator Method
g)	IS 2552 : 1989 (Third Revision) Reaffirmed 2013 AMD 1	Steel Drums (Galvanized and Ungalvanized).

3 MATERIAL/FINISH

3.1 Paraffin Liquid, Grade I shall consist essentially of a mixture of liquid hydrocarbons and be transparent, colourless, odourless and free from any visible impurities and foreign matter.

3.2 The material shall be of the quality as per the specification.

4 MANUFACTURE

4.1 Liquid Paraffin, Grade I shall be manufactured by a process, which will produce the product conforming to this specification.

5 TENDER SAMPLE

5.1 The manufacturer/supplier/contractor shall submit a tender sample of 250 g essentially from the same batch/lot of manufacture, free of all charges and conforming to this specification, when called for in the tender.

6 PRE-INSPECTION OF STORES/CONSIGNMENT

6.1 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.

6.2 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.

7 QUALITY ASSURANCE

7.1 Inspection

7.1.1 The Paraffin Liquid, Grade I, for Ammunition and the packages in which it is packed shall be subjected to inspection by and to the approval of the Quality Assurance Officer/Quality Assurance Authority.

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

7.2 Sampling

7.2.1 Normally two representative samples each of 500 g shall be drawn from each batch/lot/consignment of supply/manufacture. However, the number of samples to be drawn shall be at the discretion of the Quality Assurance Officer/Quality Assurance Authority.

7.3 Criteria for Conformity

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

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

7.4 Test Requirements

7.4.1 Samples taken from any portion of batch/lot/consignment shall conform to clause 3 above and shall comply with the following requirements.

Test Requirements of Paraffin Liquid Grade I for Ammunition

<i>S No.</i>	<i>Characteristics</i>	<i>Passing Standard</i>	<i>Test Method</i>
a)	Relative density at 27°C/27°C	0.863 <i>Min</i> 0.878 <i>Max</i>	IS 1448 (Part 32)
b)	Cold test	should pass the test	Appendix 'A'
c)	Sulphur	should pass the test	Appendix 'B'
d)	Acidity to Methyl orange	Nil	Appendix 'C'
e)	Viscosity (kinematic) at 27°C ±1°C in m ² /s (See note 1 below)	140 x 10 ⁻⁶ <i>Min</i> 155 x 10 ⁻⁶ <i>Max</i>	IS 1448 (Part 25)
f)	Ash, % by mass	0.05 <i>Max</i>	IS 1448 (Part 4)
g)	Flash point (closed test, Pensky Martins)	177°C <i>Min</i>	IS 1448 (Part 21)
h)	Practical trial	should conform suitability	Appendix 'D'
* j)	Purity	Appendix 'E'	Appendix 'E'

NOTES-

1 1 cst (Centistoke) = 10⁻⁶ m²/s

***2** 'Purity' may be carried out for material when used for separation of NG from acids in the manufacture of Nitroglycerine as given in Appendix 'E' to this specification.

8 WARRANTY

8.1 The stores supplied against this 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.

9 PACKAGING

9.1 Paraffin Liquid, Grade I shall be supplied in dry, clean, leak proof, rust free, galvanized, steel drums of mutually agreed capacity between purchaser and supplier conforming to grade B₁ /B₂ of IS: 2552.

9.2 The material packed in any other package shall receive prior approval of Quality Assurance Officer/Quality Assurance Authority.

9.3 The inclusion of any foreign matter or impurities in any of the packages shall render the whole consignment liable to rejection.

10 MARKING

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

- a) Nomenclature and Specification Number of the Material.
- b) Name and Address of the Consignee.
- c) A/T or S.O. Number and Date.
- d) Consignment Number.
- e) Batch No. and Date of Manufacture.
- f) Gross and Net Mass.
- g) Consecutive Number of Package and Total Number of Packages in the Consignment.
- h) Date of Supply.
- j) Manufacturer's Initials or Recognised Trademark.

10.2 In addition to the above the Quality Assurance Officer/ Quality Assurance Authority may suggest some more marking/identification considered suitable at the time of inspection.

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

11 DEFENCE STORES CATALOGUE NUMBER

11.1 The Defence Stores Catalogue Number allotted to this store is 9160-000 016.

12 SAFETY OF OPERATIONS

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

13 SUGGESTIONS FOR IMPROVEMENT

13.1 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 COLD TEST

A.1 Place 50 g \pm 1 g of the material previously dried by heating at 100°C for 2 h and cooled in a desiccator over Sulphuric Acid in a glass cylindrical vessel having an internal diameter of approximately 25 mm. Close the vessel and immerse into Ice water bath at 0°C and maintain at 0°C for 4 h. At the end of 4 h the liquid shall be sufficiently clear so that a black line of 0.5 mm width held vertically behind the vessel is easily seen.

Appendix 'B'

B SULPHUR

B.1 A mixture of 4 g of the material with 2 ml absolute Alcohol and 2 drops of a clear saturated solution of Lead mono oxide (PbO) in 20% Sodium hydroxide solution, heated to 70°C for 10 minutes with frequent shaking, shall remain colourless.

Appendix 'C'

C ACIDITY TO METHYL ORANGE

C.1 Prepare an aqueous extract by agitating 10 g of the material with 100 ml neutral distilled water, for ten minutes. Add a few drops of Methyl orange indicator solution to the extract. It shall not indicate acidity. If there is acidity, titrate with standard 0.1 N alkali and calculate as H₂SO₄.

Appendix 'D'

D PRACTICAL TRIAL

D.1 When the material is required for use in the manufacture of P.E. oil, it shall be subjected to practical trial to confirm its suitability for the end use. This test shall be carried out only after it has been sentenced acceptable for other technical requirements of Paraffin Liquid, Grade I. The decision of the Quality Assurance Officer/Quality Assurance Authority on the results of practical trial in consultation with the user Ordnance factory shall be final and binding on the contractor/supplier.

NOTE- The quantity required for practical trial will be intimated by the user Ordnance factory to the contractor/supplier.

E TEST FOR PURITY

E.1 This test is applicable for the material for use in separation of NG from spent acids (in the Biazzi Process).

E.2 Maunene Test

E.2.1 With Sulphuric Acid

- i) Strength of Sulphuric acid - 96%
- ii) Quantity of Paraffin liquid - 10 g (for test)
- iii) Quantity of Sulphuric acid - 50 ml (for test)

Mixing of the above is carried out at ambient temperature (both for acid and Paraffin liquid).

Maximum rise in temperature shall not exceed 1°C.

E.2.2 With Mixed Acids

- i) Composition of mixed acids.
 - aa) Sulphuric acid - 48.5% to 50.0%
 - ab) Nitric acid - 50.0% to 51.5%
- ii) Quantity of Paraffin liquid for test - 10 g
- iii) Quantity of mixed acid for test - 50 ml

Mixing of the above is carried out at ambient temperature (both for mixed acid and Paraffin liquid).

Maximum rise in temperature shall not exceed 5°C

E.3 Colouration Test with Mixed Acid

E.3.1 15 g of Paraffin oil is mixed with 15 ml of mixed acid in a ground stoppered 50 ml Erlenmeyer flask after initial conditioning of the reactants at 40°C. The mixture is strongly shaken for 12 minutes. To pass the test there should not be any development of orange coloration in either oil or acid phase.

Pale yellow or yellow colouration is considered acceptable.

E.4 HNO₂ Increase Test with Mixed Acid

E.4.1 15 g of Paraffin oil is mixed with 15 ml of mixed acid in a ground stoppered 50 ml Erlenmeyer flask. The mixture is strongly shaken for 2 minutes and immersed for 4 hrs in a thermostatic water bath kept at a temperature of 50°C. The contents of flask will be periodically shaken and its temperature will be noted. The flask will be cooled if the temperature of the contents has gone over 50°C.

After 4 hrs duration of reaction as mentioned above, 2 g of sample is drawn and the reducers content expressed as HNO₂ is then determined by means of KMnO₄. The result is compared with the % HNO₂ of the starting mixed acid.

E.4.2 The Paraffin oil is of acceptable quality when increase of HNO₂ percent is not higher than 2.50.

E.5 Bromine Number

Test method - IS 1448 (Part 43)

Test value - 8.0 *Max*

The amendments are suggested by CQA (ME) Pune, vide their letter No. CQA (ME)/7225/24 dated 03 Nov 2011.