DC No. 5383-ME
21.12.15

IND/ME/872 :2015

DIAMYL PHTHALATE

(D.S. Cat No.: 6810 – 001 158)

सत्यमेव जयते

गुणता में विश्वास

CONTROLLERATE OF QUALITY ASSURANCE (MILITARY EXPLOSIVES)

AUNDH ROAD, PUNE - 411 020.

DEPARTMENT OF DEFENCE PRODUCTION

MINISTRY OF DEFENCE

MASTER COPY

AMENDMENT RECORD

Amendment		Authority	Clauses Affected	Remarks
D.C.	DATE			

DIAHYL PHTHALATE

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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/872 (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 supply and inspection of diamyl phthalate.

1.2 The material is suitable for use in the manufacture of propellants.

2. RELATED SPECIFICATIONS AND DOCUMENTS

2.1 The related documents mentioned at clause 2.2 are those applicable at the date of publication of this specification. It is contractor' s/manufacturer's responsibility to confirm their current applicability and to obtain from the Authority Holding Sealed Particulars (i.e. 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 the preparation of this specification:-

IS 2362 – 1993 (Reaffirmed 2010)	-	Determination of water by Karl Fischer Method – Test Method
IS 2552- 1989 AMD-1, (Reaffirmed 2011)	-	Steel Drums (Galvanised and Ungalvanised)
IS 138 : 1992 AMD-1 (Reaffirmed 2009)	-	Ready mixed Paint, Marking for Packages and Petrol Containers.
IS 9591 : 1996 (Reaffirmed 2008)	-	Plasticizer Esters – Method of sampling and tests

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

SPECIFICATION		**SOURCE OF SUPPLY**
IS Specification	:	The Bureau of Indian Standard, Manak Bhavan 9, B. S. Zafar Marg, NEW DELHI- 110 002. or Their regional / branch offices

IND/ME/ Specification : C. Q. A. (ME),
AUNDH ROAD,
PUNE - 411 020.

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 diamyl phthalate shall consist essentially of the diester of phthalic acid and amyl alcohol [$C_6 H_4(COOC_5 H_{11})_2$]. The material shall be clear, transparent, colourless to pale yellow liquid and free from suspended, matter and visible impurities.

4. TENDER SAMPLE

4.1 The contractor shall submit two tender samples, each of 500 g essentially from the same consignment/ batch/lot of manufacture, free of charge and conforming to this specification.

5. PRE-INSPECTION

5.1 Before tendering the store to the Quality Assurance Officer, 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 Quality Assurance Officer.

6. QUALITY ASSURANCE

6.1 Inspection

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

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

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

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

6.2 **Sampling**

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

6.3. **Test Requirements**

6.3.1 Samples drawn from any portion of the supply shall be in accordance with clause 3.1 above and in addition, shall comply with the following requirements :-

Sl. No.	characteristics	Passing standard	Test method reference
1	2	3	4
1 .	Colour in Hazen Units, Max.	500	IS 9591 :Method No 6
2.	Relative density @ 27°C/ 27°C Min. Max.	1.015 1.020	IS 9591 :Method No 7
3.	Refractive Index @ 27°C/27°C Min. Max.	1.4815 1.4835	IS 9591 :Method No 8
4.	Volatile matter Percent by mass Max.	2.5	Appendix 'A' to this specn.
5.	Water content, Percent by mass Max.	0.25	IS 9591 : Method No. 9 AND IS : 2362
6.	Ash, Percent by mass Max.	0.01	IS 9591 :Method No 10
7.	Acidity (as phthalic acid), Percent by mass, Max.	0.02	IS 9591 :Method No 11
8.	Ester content (as diamyl phthalate), Percent by mass, Min. Max.	98 102	Appendix 'B' to this specn.
9.	Abel Heat Test Mixed with NG (1 g + 1 g)	Must not decrease values of Abel test for N.G.	Appendix 'C' to this specn.

7. **PACKAGING AND MARKING**

7.1 **Packaging**

7.1.1 The diamyl phthalate shall be supplied in sound clean and dry mild steel drums, quality B_1 or B_2 to specification IS : 2552 -1970, capacity , 20 litres each.

7.1.2 The containers require special care to be taken for cleaning to avoid contamination by seaming compound, dirt, dust, grease remaining inside the container. .

7.1.3 Offer of material in any other packages shall receive prior approval of the Quality Assurance Authority.

7.1.4 The inclusion of any foreign matter or visible impurities in any of the packages shall render the whole consignment liable for rejection.

7.2 Marking

7.2.1 All packages constituting a consignment shall be durably and legibly marked with the following details as applicable:-

i) Nomenclature and specification No. of the material.

ii) Name and address of the consignee,

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

iv) Consignment No.

v) Lot No. or 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 initial or recognised trade mark

7.2.2 In addition to above, the Quality Assurance Officer may suggest some more additional marking/identification at the time of inspection.

7.2.3 The paint used for marking should be of good quality (conforming to IS: 138 latest issue) and to the satisfaction of the Quality Assurance Officer.

8.0 DEFENCE STORE CATALOGUE NUMBER

8.1 Defence Store Catalogue number allotted to the store is :- 6810 – 001 158

Date :- 08/12/2015

(Mrs. MGP DHANRAJ)
Controller
CQA [ME], PUNE.

9. APPENDICES

APPENDIX 'A'

DETERMINATION OF VOLATILE MATTER

Take 10 g of diamyl phthalate accurately weighed into a tared ground glass stoppered weighing bottle. Allow the sample to stand on a steam bath for 6 hours without stopper. Carefully wipe off the weighing bottle, cool for 1 hour to room temperature in a desiccators and weigh. Record the result in per cent to two decimal places.

$$\text{Volatile matter Percent by mass} = \frac{\text{Loss in mass of sample}}{\text{mass of the sample taken for the test.}} \times 100$$

APPENDIX 'B'

DETERMINATION OF ESTER CONTENT

Take about 2 g of the sample accurately weighed, into 250 ml extraction flask and dissolve in 100 ml of neutral ethyl alcohol. Add from a burette 50.0 ml of 0.5 N sodium hydroxide solutions. Connect a reflux condenser to the flask and heat for 2 hours when the sample will be completely saponified.

Cool to room temperature and titrate the excess sodium hydroxide solution with 0.5 N sulphuric acid solution using phenolphthalein as indicator. Run a blank determination at the same time. 1 ml of 0.5 N sodium hydroxide solution is equivalent to 0.0765 g of diamyl phthalate.

$$\text{Diamyl phthalate Percent by mass} = \frac{(b - a) \times f \times 0.0765 \times 100}{m} - 1.843\ A$$

Where,

a = volume in ml of 0.5 N H_2SO_4, used for the sample.

b = volume in ml of 0.5 N H_2SO_4. used for the blank.

f = factor of 0.5 N sulphuric acid solution

m = mass of sample taken, for the test.

A = Acidity (as phthalic acid) expressed as percent by mass.

APPENDIX 'C'

DETERMINATION OF ABEL HEAT TEST WHEN MIXED WITH NG

Mix equal portions of diamyl phthalate and nitro-glycerine (1 g + 1 g) and execute the Abel Heat Test by the regular procedure. Compare the Heat Test value with that of NG alone.