Certified Correct Copy of Sealed/Uncealed Drawings Specification At this date March 93

for C. I. M. E. Direct

DCP 2949-ME
02.02.93.

IND/ME/799(a)
OCT. 1976

3178-ME
4.10.94

PENTA ERYTHRITOL

(DS Cod NO. 1276-000143)

07-01-20

APPROVAL REFERENCE	DATE OF APPROVAL	APPROVING AUTHORITY
79799/DGI(ARM-13)	16-11-1976	D.I. (ARMTS)

QUALITY ASSURANCE

CONTROLLERATE OF ~~INSPECTION~~ (MILITARY EXPLOSIVES) KIRKEE

DEPARTMENT OF DEFENCE PRODUCTION

MINISTRY OF DEFENCE

...2/-

0. FOREWORD

0.1 This specification has been prepared by the CONTROLLERATE OF ~~INSPECTION~~ (MILITARY EXPLOSIVES), KIRKEE PUNE - 411 003 QUALITY ASSURANCE

0.2 For additional copies or any other enquiry regarding this specification, reference should be made to the Inspecting Authority named in the tender or contract [i.e. ~~CI~~ CQA (ME) KIRKEE].

1. SCOPE

1.1 This specification is meant to govern supply and inspection of penta erythritol.

1.2 The material is suitable for use in the manufacture of PETN (Penta erythritol tetra nitrate).

2. RELATED 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 responsibility to confirm their current applicability, and to obtain from the Authority Holding Sealed Particulars [ie. ~~CI~~ CQA (ME) KIRKEE] information concerning any change that may be necessary due to cancellation, replacement or supersession of any of these documents.

2.2 Copies of the related specifications referred to in clauses 8.1 and 9.1 are obtainable as shown below :-

JSG:0112-1991 ~~JSS : 1010~~ and ~~IND/ME/698~~ JSS 1376-06:1994	Controllerate of ~~Inspection~~ QUALITY ASSURANCE (Military Explosives), KIRKEE, PUNE - 411 003.

...5/-

IND/ME

AMENDMENT RECORD

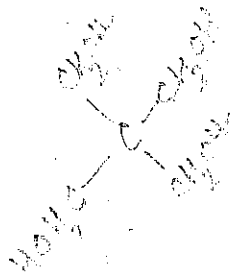
Amendment DC(I) No.	Date	Authority	Affected clauses	Remarks
3178-ME	4.10.93	DS code No. added on covering page		[illegible]
3754-ME	12.12.2002	Front page Page 4 Top para last line Clause 0.1 2nd line Clause 0.2 last line Clause 2.1 5th line Clause 2.2		

IND/ME/799(a)

PENTA ERYTHRITOL

C O N T E N T S

...4/-



IS - 460-1962 { Indian Standards Institution,
{ Manak Bhavan,
{ 9, Bahadur Shah Zafar Marg,
{ NEW DELHI - 110 002.

3. DESCRIPTION

3.1 The material shall essentially consist of penta erythritol, $C(CH_2OH)_4$, a polyhydric alcohol.

3.2 The penta erythritol shall be of nitration grade. It shall be white in colour and in crystalline state with good flowing property. It shall be free from fines, foreign matter, visible impurities and gritty matter.

4. TENDER SAMPLE

4.1 The contractor shall submit two samples, each of 250 g, essentially from the same batch/lot of manufacture, free of charge and conforming to this specification.

4.2 If required by the terms of contract, the contractor shall also have to tender the required quantity of penta-erythritol (about 20 kg) or as called for in the contract for confirming the suitability of the store for trial nitration and stability test of the end product. This trial will be taken up only when the tender sample conforms to all other requirements of this specification. Under no circumstances, material not conforming to this specification will be subjected to trial nitration.

5. PRE-INSPECTION

5.1 Before tendering the store to the Inspector, 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 Inspecting Officer.

6. INSPECTION

6.1 The penta-erythritol and the packages in which it is contained shall be subject to inspection by and to the final approval of the Inspecting Officer/ Authority.

...6/-

6.2 The samples of the material and the packages in which it is contained may be taken from any portion of a consignment.

6.3 If, on examination, any sample be found not to conform to this specification, the whole consignment is liable for rejection.

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

7. SAMPLING

7.1 Normally two representative samples, each of 250 g of the material shall be drawn from each batch/lot. However, the number of samples to be drawn will be at the discretion of the Inspecting Officer.

8. TEST REQUIREMENTS

8.1 Samples taken from any portion of the supply shall comply with clauses 3.1 and 3.2 above and shall also conform to the following test requirements :-

Sl. No.	Characteristics	Passing Standard	Test Method
1	2	3	4
1.	Moisture content, percent, Max.	0.05	Appendix 'A' to this specification
2.	Melting point, °C Min.	254	Appendix 'B' to this specification
3.	Solubility in water at 27°C g/100 ml	7 to 9	Appendix 'C' to this specification
4.	*Ash content, percent, Max.	0.05	No.2 (a) of ~~JSS 1010~~ JSG 0112
5.	(a) Chlorides	Nil	No.7 (a) or 7 (b)
	(b) Sulphates	Nil	No.8

* shall not be gritty in nature

..7/-

Sl. No.	Characteristics	Passing Standard	Test Method
1	2	3	4
6. Ø	Sieving		
	(a) Retained on 1 mm IS Sieve	Nil	No. 18
	(b) Retained on 212 /um IS Sieve	All	No. 18

JSG: 0112-1

* shall not be gritty in nature
Ø particulars of IS Sieves referred to will be found in IS 460 - 1962.

9. PRACTICAL TRIAL

9.1 If required by the terms of contract, the firm is expected to supply about 20 kg of penta erythritol for trial nitration before bulk consignment is accepted. Quantity required for practical trial will be representative of the bulk supply and shall be drawn by the Inspecting Officer along with the bulk supply samples. The material shall pass the practical trial for evaluating suitability for nitration process, and quality of the end product which in turn should conform to the requirements and stability tests stipulated in specification IND/ME/698.

10. PACKING AND MARKING

10.1 Packing

10.1.1 The penta erythritol shall be packed in clean, dry, sound polythene bags of film thickness 0.13 mm, suitably sealed to render it air tight. The polythene bag shall be further packed in closely textured gunny bag/dosooti bag and finally packed in wooden cases. Quantity per package shall not exceed 50 kg.

10.1.2 Supplies offered in any other packages shall have prior approval of the Inspecting Authority.

Polythene bag → gunny bag → wooden cases ..8/-

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

10.2 Marking

10.2.1 The packages constituting a consignment shall each be legibly and durably marked with the following details :-

(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 mass and net mass

(vii) Consecutive No. of package and total No. of packages

(viii) Date of supply

(ix) Contractor's initial or recognised trade mark.

10.2.2 In addition to above, the Inspecting Officer may suggest some more marking/identification at the time of inspection.

10.2.3 The paint or any other material used for the marking shall be of good quality and to the satisfaction of the Inspecting Officer.

Surjit Singh

(Dr.SURJIT SINGH)
DIRECTOR
CONTROLLER OF INSPECTION (MILITARY EXPLOSIVES)
for DIRECTOR OF INSPECTION (ARMAMENTS)

...9/-

11. APPENDICES

APPENDIX 'A'

MOISTURE CONTENT

Place a clean, ground glass stoppered moisture dish in an oven at about 105°C for at least 30 minutes. Cool in a desiccator for 1 hour. Transfer 5g± 0.1 g of the sample, accurately weighed (M) to the dish, replace the lid and weigh accurately (M1). Remove the lid and place it with the dish in an oven at 70°C ± 2 deg C. Remove the dish from the oven, replace the lid, allow it to cool in a desiccator to room temperature and re-weigh (M2) to constant mass.

Calculate the moisture content as percentage on the original sample.

$$\% \text{ moisture content} = \frac{M1 - M2}{M} \times 100$$

APPENDIX 'B'

MELTING POINT

Pack finely ground and dried sample in a clean, dry, melting point capillary tube to a height of about 3 mm. Determine the melting point by usual standard method in an electrically heated melting point apparatus or in liquid paraffin bath. The apparatus is heated comparatively rapidly in the beginning until the temperature is within 15°C of the melting point of the substance (ie. say upto 240°C) and then slowly, controlling the rate of heating at about 2 degrees per minute. The temperature at which the substance commences to liquefy and the temperature at which the solid has disappeared are observed (ie. the melting point range). Record the temperature when the sample has half melted. The temperature reading is corrected by reference to calibration chart of the thermometer and reported as 'melting point'.

.10/-

IND/ME/799 (a)

APPENDIX 'C'

SOLUBILITY IN WATER

A saturated solution of the sample in distilled water at 27°C is made, from which after filtration through 42 Whatman filter paper, 50 ml is pipetted into a previously dried and tared evaporating dish. The solution is evaporated to dryness. Cool in a desiccator and weigh the dish to constant mass. Express the gain in mass as percentage solubility in 100 ml water at 27°C.