SPEC - 2146

Certified Correct Copy of
Sealed/Unsealed Drawing s /
Specification
As this date 12-4-76
for C. I. M. E. Kirkee

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RC
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IND/ME/748(b)

Nov. 1976.

Supersedes specification IND/ME/192(b).

RUBBER, NATURAL, UNVULCANIZED

APPROVAL REFERENCE	DATE OF APPROVAL	APPROVAL AUTHORITY.
No. 73729/DGI/ (Arm-13)	01st Feb. 1977.	D.I. (ARMS).

EXPLOSIVES RESEARCH & DEVELOPMENT LABORATORY KIRKEE (SPEC-2146)

CONTROLLERATE OF INSPECTION (MILITARY EXPLOSIVES)

KIRKEE, PUNE - 411 003.

DEPARTMENT OF DEFENCE PRODUCTION .

MINISTRY OF DEFENCE.

Certified for use

6.4.12 JT. CM/TS

IND/ME/748(b)

AMENDMENT RECORD

Amendment		Authority letter from D.I.(Armts)	Clauses affected	Rema
D.C.I. NO.	Date			

IND/ME/748(b)

6

(b)

RUBBER, NATURAL, UNVULCANIZED

CONTENTS

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0. FOREWORD

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

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

1. SCOPE

1.1 This specification is meant to govern supply and inspection of rubber, natural, unvulcanized.

1.2 The material is suitable for use in the manufacture of oil, plasticising (for plastic explosive) and in certain cements/adhesives for use in ammunition.

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 (CI(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 Sl. Nos. 1 and 2 and 9.1 are obtainable as shown below :-

i)	IND/ME/494(e) (Oil plasticising) (for plastic explosive)	Controllerate of Inspection (Military Explosives) KIRKEE, PUNE -411 003.
ii)	IS:3660 (Part I)-1972	Indian Standards Institution, Manak Bhavan, 9, Bahadur Shah Zafar Marg, NEW DELHI 110 002.

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3. DESCRIPTION

3.1 Rubber, natural, unvulcanized, shall consist of first grade plantation Heavea rubber either as pale crepe rubber or as smoked sheet rubber in the form of sheet of thickness not exceeding 6.5 mm or in the form of curly scrap.

3.2 Rubber, natural, unvulcanized, shall be free from surface tackiness, visible impurities, foreign matter and silicious matter.

NOTE : Pale crepe rubber known indigenously as PLC I or PLC-I-X and smoked sheet rubber known as RMA will generally be found to satisfy the requirements of this specification.

4. TENDER SAMPLE

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

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 Rubber natural, unvulcanized, and the packages in which it is contained shall be subject to inspection by, and to the final approval of the Inspecting Officer/ Inspecting Authority.

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 may be rejected.

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

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7. SAMPLING

7.1 Normally two representative samples, each of 50 of the material, shall be drawn from each batch/lot. However, the number of samples to be drawn will be at t discretion of the Inspecting Officer.

8. TEST REQUIREMENTS

8.1 Samples taken from any portion of the supply sh 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.	Volatile matter, percent, Max.	1.0	IS 3660(Part 1972(NR 2).
2.	Ash, percent, Max.	0.5	IS 3660 Part 1972 (NR 3).
3.	Matter soluble in acetone, percent, Max.	4.0	Appendix 'A'
4.	Acidity as acetic acid (CH_3COOH), percent, Max.	0.1	Appendix 'B'
5.	Sulphur and sulphur compounds as sulphur(S), percent, Max.	0.05	Appendix 'C'

9. PRACTICAL TRIAL

9.1 When required for the manufacture of oil plasticising to IND/ME/494(e), the material shall be subjected to practical trial on laboratory/plant scale at the consignee's end. Sufficient quantity (approximately

.....7.

20 kg or as stipulated in the contract/S.O.) will be submitted to the consignee for the practical trial. The decision of the consignee in consultation with the Inspecting Officer/Inspecting Authority on the practical trial, shall be final and binding on the contractor.

NOTE : The practical trial shall be at the discretion of the Inspecting Officer/Inspecting Authority.

10. PACKING AND MARKING

10.1 Packing

10.1.1 When supplied in the form of sheets, these shall be packed in good commercial quality paper or polythene sheets from all sides so as to prevent ingress of dust etc., during transit and storage. These in turn shall be packed in gunny bags or wrapped in hessian cloth and securely stitched. The mass of each package shall not exceed 50 kg or as agreed to between the purchaser and supplier.

10.1.2 When supplied in the form of curly scrap, the material shall be loosely placed inside a good commercial quality gunny bag internally lined with good commercial quality paper or polythene and the mouth of the bag securely stitched. The mass of each bag shall not exceed 50 kg or as agreed to between the purchaser and supplier.

10.1.3 The inclusion of any foreign matter or visible 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 as applicable :-

i) Nomenclature and specification number of the material.

ii) Name and address of the consignee.

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

iv) Consignment No.

.....8.

v) Lot No. or Batch No. and date of manufacture.

vi) Gross and net mass.

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

viii) Date of supply

ix) Contractor's initial or recognised trade mark.

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

Surjit Singh

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

11. APPENDICES

APPENDIX 'A'

DETERMINATION OF MATTER SOLUBLE IN ACETONE

Roll about 10 g of the material between suitable rollers until it is thoroughly blended in the form of a very thin sheet.

Extract 3 g ± 0.01 g of the rolled material, accurately weighed and suitably wrapped in a clean filter paper, for about 18 hours with dry acetone in a double-walled soxhlet extractor, the rate of syphoning of the solvent being adjusted to about 12 to 15 numbers per hour.

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Transfer the extract carefully to a suitable tared flask (using dry acetone for rinsing), evaporate the solvent, dry the residue in a boiling-water oven for 3 hours, cool in a desiccator to room temperature and reweigh to constant mass.

$$\% \text{ matter soluble in acetone} = \frac{\text{Mass of residue}}{\text{Mass of the material taken}} \times 100$$

APPENDIX 'B'

DETERMINATION OF ACIDITY

Reflux 10 g ± 0.05 g of the material, accurately weighed and cut into small pieces, with 100 ml of freshly boiled distilled water for 1 hour. Decant the extract into a 250 ml Erlenmeyer flask and titrate with standard 0.02 N sodium hydroxide using phenolphthalein as indicator.

Carry out a blank on the distilled water used.

$$\% \text{ Acidity as } CH_3COOH = \frac{(a - b) \times f \times 0.12}{\text{Mass of the material taken}}$$

Where a = volume of 0.02 N sodium hydroxide required for the titration.

b = volume of 0.02 N sodium hydroxide required in the blank.

f = factor of 0.02 N sodium hydroxide.

APPENDIX 'C'

DETERMINATION OF SULPHUR AND SULPHUR COMPOUNDS

Cut 5 g ± 0.01 g of the material, accurately weighed, into small pieces and keep it immersed in a silica or porcelain dish under about 100 ml of pure, sulphate-free brominated nitric acid containing about 5 g pure, sulphate-free-potassium nitrate. Cover the dish with a watch-glass. Warm the contents of the dish on a water bath carefully, until the reaction subsides and all the rubber is oxidised. Additional quantities of the nitric acid may be used judiciously, if necessary, to effect

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complete oxidation. Wash down any liquid adhering to the watch-glass into the dish with a jet of hot water.

Evaporate the contents of the dish to dryness on a sand-bath twice with 10 ml of concentrated sulphate-free hydrochloric acid. Finally, add 10 ml of hydrochloric acid and 100 ml of water, take to boiling and filter through a washed No. 42 Whatman filter paper. Wash the filter paper with warm water.

Collect the filtrate and washings, in a 400 ml beaker, dilute to about 200 ml, boil and add drop by drop, about 5 ml of a hot 10% solution of barium chloride.

Allow the precipitate to settle over-night. Filter through a washed No. 42 Whatman filter paper, wash it till free of chlorides, dry, ignite in a tared silica-porcelain crucible and weigh the barium sulphate.

Carry out a blank under identical conditions.

Percentage sulphur and sulphur compounds calculated as sulphur :-

$$= \frac{(x - y) \times 13.73}{\text{Mass of the material taken}}$$

Where x = Mass of the barium sulphate obtained with the material.

y = Mass of the barium sulphate obtained in the blank.

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