

C.S.2724

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22.5.58
SSA (PR)

Any question that may arise relative to this specification should be referred to the Director of Chemical Inspection, Ministry of Supply.

The technical requirements of this specification conform in detail to the technical requirements of Admiralty Specification K.1415.

ETHYL CELLULOSE, HIGH VISCOSITY

Specification to govern supply and inspection

7/PKG/56

approved 23.8.56

DMXPD.1075/5

1. SCOPE

This specification is designed to govern the supply of ethyl cellulose flake for use in connection with inhibitive coatings in contact with propellant explosives.

2. RELATED SPECIFICATIONS

(a) Reference is made in this specification to:-

- B.S.410 Test Sieves.
- B.S.188 Determination of Viscosity of Liquids.
- B.S.805 Toluole, Part 1, Pure Toluole.
- C.S.1613 Alcohol, Industrial, Special.

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(b) Reference to British Standards and C.S. Specifications are to current issues.

3. REQUIREMENTS

The Ethyl Cellulose shall consist essentially of the product of ethylation of suitable cellulose. It shall be white in colour and in a fine state of sub-division. It shall be capable of being stored for a period of up to 2 years, under cover, in a temperate climate, in the containers supplied by the contractor, without any appreciable deterioration.

4. ✓ INSPECTION

- (a) The ethyl cellulose and the packages in which it is contained shall be subject to inspection by and the final approval of the Inspecting Officer.
- (b) Samples of the material and of the packages may be taken from any portion of a consignment and shall comply in every respect with the terms of this specification.
- (c) If, on examination, any sample be found not to conform to this specification, the whole consignment may be rejected. All samples shall be supplied free of charges.
- (d) The foregoing provisions shall apply to prime contractors and to any sub-contractors.

5. ✓ TESTING

(a) General

The material shall be in accordance with the requirements of paragraph 3 above and shall be free from foreign matter and visible impurities.

(b) Volatile matter

The loss in weight when approximately 2 grammes of the material, thinly spread in a shallow dish, are heated at $100 \pm 2^{\circ}\text{C}$ for 30 minutes shall not exceed 3.0 percent.

(c) Ash

The amount of ash remaining after complete ignition of the material at a temperature not exceeding 600°C shall not exceed 6.4 per cent.

(d) Acidity or Alkalinity

An aqueous extract of the material prepared as in Appendix A shall have a pH value between 5.5 and 8.0. The determination shall be carried out within 30 minutes of the preparation of the extract.

(e) Chlorides

The material shall not contain chlorides, calculated as sodium chloride, in excess of 0.05 per cent when determined on the aqueous extract as in Appendix A.

(f) Sulphates

The material shall not contain sulphates, calculated as sodium sulphate, in excess of 0.10 per cent when determined on the aqueous extract prepared as in Appendix A.

(g) Ethoxy content

The ethoxy content of the material dried as in paragraph 5(b) shall be within the range 47.5 - 49.5 per cent.

(h) Solubility

A solution of the material prepared as in Appendix B shall be clear and free from any insoluble matter.

(j) Viscosity

A solution of the material prepared as in Appendix B shall have a viscosity within the range 160-295 centistokes (135-250 cps) when determined at $25 \pm 0.2^\circ\text{C}$. according to B.S.188 .

(k) The material will be treated as described in Appendix C. A solution of the treated material will then be prepared as described in Appendix B and its viscosity determined at $25 \pm 0.2^\circ\text{C}$ according to B.S. 188. The viscosity shall not be less than 50 per cent of the figure obtained as in paragraph 5(j), or 100 centistokes, whichever is the greater. ✓

✓ 6. PACKAGING

The material shall be supplied in sound, clean and dry approved packages containing an approved quantity.

The packages constituting a consignment shall each be legibly and durably marked with a description of the contents, the number of this specification, the contract number, a distinctive lot or batch number, the date of supply, the contractor's initials or recognised trade mark and such other requirements as may be laid down in the order or contract.

The paint, when required for the packages, and also the paint or other material used for marking, shall be of good quality to the satisfaction of the Inspecting Officer.

A. BREWIN

for L.M.X.R.D.

Ministry of Supply

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APPENDIX A

Preparation of Aqueous Extract

Reduce the particle size of the material so that it will pass a B.S. 30 mesh sieve* Weigh a suitable quantity into a glass stoppered bottle and cover the material with ten times its own weight of boiling, neutral distilled water. Agitate thoroughly, then allow the suspension to cool naturally for one hour with occasional shaking. Filter.

* The B.S. sieve mentioned in this specification is a Fine Mesh Normal Test Sieve, governed by British Standard 410:1943, (obtainable from the British Standards Institution, 2 Park Street, London, W.1.)

APPENDIX B

Preparation of Solution for Solubility and Viscosity Tests

Solvent Mixture Toluole, to B.S.805 Part 1,
 pure Toluole - 80 parts by weight.

 Alcohol Industrial Special
 to C.S.1613 - 20 parts by weight.

Dry a suitable amount of the material, as laid down in para. 5(b) and treat it with the above solvent mixture to give a concentration of 5 per cent (w/w) ethyl cellulose.

Shake the mixture until a homogeneous solution is obtained.

APPENDIX C

Heat Stability Test

Spread 5 g. of the material evenly in a glass petri dish of approximately 4 inches diameter and heat it in a well ventilated oven at $130 \pm 2^\circ \text{C}$. for one hour. Cool in a desiccator.

srk/

