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for CIMF/KIRKEE

SPECIFICATION C.S. 5301.B
(5 pages)
Amendment B dated 29.12.65

This specification is the property of Her Britannic Majesty's Government and may only be used in relation to enquiries, tenders or orders placed on behalf of Her Britannic Majesty's Government or other members of the British Commonwealth of Nations. It is not to be used for any other purpose whatsoever without the specific sanction of the Director of Chemical Inspection, Ministry of Defence.

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

The technical requirements of this specification conform in detail to the technical requirements of Naval (C.I.N.O.) specification K.1565.C.

WAX, SPECIAL No. 6,

Grades 1 and 2

(A... 67) Date of approval 16th November, 1960

This specification covers two grades of high melting point wax; grade 1 is for use as an ingredient of high explosives and grade 2 is for use in high explosives substitutes.

...TED DOCUMENTS

Reference is made in this specification to:-

(i) British Standard 410,	'Test sieves'.
(ii) 'IP Standards for Petroleum and its Products' Part I, Sections 1 and 2,	(Institute of Petroleum).
(iii) Specification DEF-102,	'Low density polythene moulding and extrusion materials for ammunition applications'.

Reference in this specification to a British Standard undated or to a DEF specification means, in any tender or contract, the edition current at the date of such tender or contract.

...ION

...ax, special No. 6, shall consist of hydrocarbon wax, completely freed from oil, and ... of lumps or cakes.

...o, the guidance of Contractors

Indramic Wax 1800, marketed by the Industrial Raw Materials Corporation, will normally be found ...omply with the requirements of this specification for grade 1 material.

Certified for use

Date 11/96 DCM...

4. TESTING

Samples taken from any portion of the supply shall be in accordance with the description in clause 3 above. They shall be free from grit and visible impurities, and shall comply with the following test limits:-

TEST	LIMIT		TEST METHOD
	Grade 1	Grade 2	
Setting point ..... °C	80 min 85 max	-	Appendix A
Congealing point ..... °C	-	80 min 86 max	IP Method 76/64
Penetration at 25°C	12 max	12 max	Appendix B
Mineral acidity	nil	nil	Appendix C
Organic acidity, KOH equivalent ..... mg/g	0·2 max	0·2 max	Appendix D
Saponifiable matter, KOH equivalent ..... mg/g	2·0 max	2·0 max	Appendix E
Matter insoluble in carbon tetrachloride ... per cent	0·1 max	0·1 max	Appendix F
Penetration at 60°C when compounded with 15 parts of polythene ..... per cent	15 min 30 max	-	Appendix G
Ash:-			
(a) Total ..... per cent	0·05 max	0·05 max	Appendix G
(b) Retained on No. 240 B.S. sieve*	nil	nil	
Exudation (7 days at 75°C) ..... per cent	3 max	3 max	Appendix H

*Particulars of the B.S. sieve referred to can be obtained from British Standard 410, Table 1.

5. CONTAINERS AND MARKING OF CONTAINERS

The Wax, special No. 6, shall be filled into sound, clean and dry containers which after filling shall hold an agreed quantity and shall be securely closed.

The containers shall each be legibly and durably marked with any markings called for by statutory requirements and in addition with the following details:-

Description and grade as shown in the title of this specification
Contract or order number
Distinctive lot or batch number
Tare and net weights
Date of manufacture
Contractor's initials or recognized trade mark
Additional markings called for in the contract or order.

The inclusion of any foreign matter or impurities in any of the containers will render the whole consignment liable to rejection.

6. INSPECTION

The Wax, special No. 6, and the containers into which it is filled shall be to the satisfaction of the Inspection Authority.

Samples of the material and of the containers may be taken from any portion of the consignment. If on examination any sample be found not to comply with the requirements of this specification the whole consignment may be rejected. All samples shall be supplied free of charge.

A. BREWIN
D.G.W.(X)

MINISTRY OF AVIATION

APPENDIX A

Method for determination of setting point

Apply the IP Standard method serial designation 55/65, with the following modifications:-

(a) The thermometer shall be an Institute of Petroleum Standard thermometer, complying with specification IP 63C.

(b) The temperature of the water bath shall be 40-50°C.

(c) Report the setting point to the nearest 0·1 °C.

APPENDIX B

Method for determination of penetration

Apply the IP Standard method serial designation 49/63, with the following modification:-

Heat the material at a temperature above its melting point but not exceeding 100°C before pouring it into the sample container.

APPENDIX C

Method for determination of mineral acidity

Add 10·0 g of the material to 100 ml of boiling distilled water in a beaker and boil until the wax has completely melted. Stir with a glass rod for 1 minute and allow to cool. Remove the crust of solidified wax and test the aqueous layer with methyl orange indicator.

APPENDIX D

Method for determination of organic acidity

Mix 70 ml of toluene and 30 ml of industrial methylated spirits, 68 degrees O.P., in a 250 ml flask and boil under a reflux condenser for 5-10 minutes. Neutralize the mixture to phenolphthalein with 0·1N alcoholic potassium hydroxide and add 10·0 g of the sample. Boil under the same reflux condenser until the wax is completely dissolved. Titrate hot with 0·1N alcoholic potassium hydroxide until a faint permanent pink colouration is obtained.

APPENDIX E

Method for determination of saponifiable matter

Reflux 10·0 g of the material with 50 ml of toluene and 25 ml of 0·1N alcholic potassium hydroxide in a 250 ml flask for 1 hour. Titrate hot with 0·1N hydrochloric acid using phenolphthalein as indicator. Carry out a blank determination on the reagents used.

APPENDIX F

Method for determination of matter insoluble in carbon tetrachloride

Dissolve 10·0 g of the material in 150-200 ml of hot carbon tetrachloride and filter hot through a tared sintered glass crucible (porosity 3) or an asbestos padded Gooch crucible. Wash with hot carbon tetrachloride until free from wax, dry the crucible in an oven at 100-105°C, cool and weigh.

APPENDIX G

Method for determination of ash

Apply the IP Standard method serial designation 4/65.

Transfer the ash obtained to a 3 inch diameter sieve having a No. 240 B.S. mesh. Brush the ash across the mesh of the sieve, using a camel hair brush until no more passes through. Record the weight, nature and particle size of any residue.

APPENDIX H

Method for determination of exudation

Prepare a cylindrical pellet by pouring the molten wax at a temperature not greater than 100°C into a mould made from glass tubing $1\frac{1}{8}$ inch internal diameter and $1\frac{1}{2}$ inch high, standing vertically on a flat porcelain plate.

Allow to cool to room temperature (about 4 hours) and remove the wax pellet from the mould. Machine the pellet by means of a lathe and trim the ends flat and square to the axis, to produce a cylinder of wax 1 inch in diameter and $\frac{3}{4}$ inch high. The finished pellet should be free from visible cracks, voids etc. Prepare duplicate pellets from each sample to be examined.

Weigh the pellet (W_1) and stand it on five thicknesses of Whatman No. 42 filter paper (4·5 cm diameter) in an open, flat bottomed glass dish (approximately 6 cm in diameter and 3 cm high). Place the dish and contents on a glass shelf ($\frac{1}{4}$ inch thick minimum) in an oven maintained at 75 ± 1°C.

After one day remove the dish from the oven and allow to cool for one hour. Change the filter papers and replace the dish in the oven. Repeat this operation after two days and again after five days.

After a total period of seven days remove the dish from the oven, allow to cool for one hour and weigh the wax cylinder (W_2).

Calculate the loss in weight as a percentage of the original material as follows:-

$$\text{Percentage loss} = \frac{W_1 - W_2}{W_1} \times 100$$

Calculate the mean of the duplicate results and report this figure as percentage exudation at 75°C for 7 days.

APPENDIX J

Method for determination of penetration of grade 1 material when compounded with polythene

1. MATERIAL REQUIRED

Low density polythene moulding material, type XD, nominal melt-flow index 20, complying with specification DEF-102.

2. METHOD

85 Parts of Wax, special No. 6, grade 1, are compounded with 15 parts of polythene.

Heat the Wax, special No. 6, grade 1, until molten, and raise the temperature to 200°C. Add the polythene steadily, with stirring, and raise the temperature to 250-260°C. Continue stirring until the polythene is completely dispersed and for a further 15 minutes.

NOTE: The above conditions are those laid down for plant scale preparations. On the laboratory scale for purposes of this test, a temperature of 220°C has been found to give satisfactory incorporation, and filtration of the melt is not normally necessary.

Filter the melt through a filter having a No. 200 B.S. mesh complying with the requirements of British Standard 410.

Determine the penetration of the material at 60°C by the IP Standard method serial designation IP 49/63, except that the procedure described in paragraphs 5(a) and 5(b) of the method will be replaced by the following:-

Heat a suitable quantity of the material until it is just pourable, and pour into a warmed penetration tin to a depth within 2-3 mm of the rim of the tin.

Place the filled penetration tin in an oven maintained at 60°C for two hours, then without allowing to cool, put into a warmed transfer dish and immerse both the dish and the filled penetration tin in a constant temperature water bath at 60 ± 2°C for one hour.

THIS SPECIFICATION IS ISSUED BY:-

THE DIRECTOR OF CHEMICAL INSPECTION,
CHEMICAL INSPECTORATE,
HEADQUARTERS BUILDING,
ROYAL ARSENAL,
WOOLWICH,
LONDON, S.E.18.