GOVERNMENT OF INDIA, MINISTRY OF DEFENCE
DGQA ORGANISATION

Specification No : IND/SL/ 3021(c)

Revised on : Apr 1990

Supersedes : IND/SL/ 3021(b)

SPECIFICATION FOR

SOAP CURD

(7930 - 000031)

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Issued by

CHIEF QUALITY ASSURANCE OFFICER
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POST BOX NO 229, KANPUR - 208 004.

Price : Rs 40/-

1. GENERAL

1.1 This specification prescribes the requirements and methods of test for Soap Curd. One percent aqueous solution of this soap is intended for use as a lubricant for deep drawing of brass and other metals, as a cutting coolant in workshops and for general washing purposes.

2. APPLICABLE DOCUMENTS

(i) IS : 280 Mild steel wire for general engineering purposes.

(ii) IS : 1029 Hot rolled steel strips (baling).

(iii) IS : 1070 Water for general laboratory use.

(iv) IS : 1398 Packing paper, waterproof bitumen laminated

(v) IS : 1503 Wooden Packing cases.

(vi) IS : 6615 General purpose packing/wrapping paper.

(vii) IS :10106(Pt 3/Sec 1) Cushioning materials.

(viii) IND/SL/8900 Sampling plans and procedures for inspection of material stores.

3. REQUIREMENTS

3.1 The soap Curd shall be white or pale yellow in colour of even texture, firm but not brittle, free from objectionable odour, dirt and extraneous matter. It shall be in the form of neat and plain rectangular bars.

3.2 Examination of samples, taken from any portion of a supply, shall show that the material conforms to the requirements given in the table below :-

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TABLE

Sl No	Tests	Requirement	Test Method Refer to Appx.
I	Dimensions of the bar lengh x width x thickness in mm	180x60x50 (approx)	-
II	Mass of the bar in g	560	-
III	Anhydrous Soap per bar in g, Min	405	A
IV	Fatty Acids, percent, bymass, Min	63	B
V	Rosin	Nil	C
VI	Titre °C, max	27	D
VII	Matter Insoluble in Alcohol (calculated on anhydrous soap), percent, by mass, max	2.5	E
VIII	Free caustic alkali (calculated as Na_2O on anhydrous soap), percent by mass, Max	0.15	F
IX	Free carbonated alkali (calculated as Na_2O on anhydrous soap) percent by mass, max	0.85	G
X	Sodium Chloride, percent, by mass, Max	0.5	H
XI	Matter soluble in diethyl ether (calculated on anhydrous soap) percent by mass, Max	3.0	J
XII	Gelatinization	Gelatinization shall not occur	K
XIII	Practical Test : In addition, the soap curd shall pass a practical test by the consignee.		

Quality of Reagent : Reagents conforming to Analar standard and distilled water conforming to IS:1070 shall be used for analysis in all tests f given above.

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4. PACKAGING

4.1 Each bar shall be wrapped separatelyw with wrapping paper conforming to IS : 6615. 210 such bars lined with paper packing water proof conforming to IS : 1398 type I shall be packed in cases, wood, packing conforming to class 'B' style 3.(b) of IS : 1503 except for the size which shall be capable of holding 210 soap bars. Empty spaces shall be filled with adequate cushioning material conforming to IS:10106 (part 3/sec 1).

4.2 The cases shall either be strapped or wired at two places. The straps shall be 13 mm in width and 0.5 mm in thickness conforming to IS: 1029. The wire shall be of mild steel 1.8 to 2.0 mm dia conforming to IS:280. The strapping/wiring shall be placed as close to the battens as possible but not over the gerth battens, round the body of the case on the inside

5. MARKING

5.1 Soap Bar

Each bar of soap shall be stamped with the following details :-

i) Manufacturer's name/supplier's name or his recognised trade mark.

ii) Batch No & Month and year of manufacture.

iii) 'SOAP CURD' in block capital letters.

5.2 Cases, Wood, Packing

Each case shall be legibly and indelibly marked on the top and on the longer sides as under :-

i) Nomenclature and catalogue No of the store.

ii) Quantity packed e.g. 210 bars.

iii) Net and gross mass of the package.

iv) Month & year of manufacture and Batch number.

v) Manufacturer's name/supplier's name or his recognised trade mark.

vi) Serial number of the package together with total number of packages in the same delivery.

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vii) Contract number and date.

viii) Name and address of the consignee.

ix) Inspection Note No and date.

6. SAMPLING PLAN AND CRITERIA OF CONFORMITY

6.1 Sampling plans and criteria of conformity shall be as per IND/SL/8900 for "Sampling plans and procedures for inspection of material stores".

Station : Kanpur
Date : Apr 90

(A.S. DIXIT) JSO
For Chief Quality Assurance Officer
Chief Quality Assurance Estt. (Materials)
Post Box No 229, Kanpur-208004.

APPENDIX 'A'

METHOD FOR THE DETERMINATION OF ANHYDROUS SOAP: PREPARATION OF SAMPLE

A.1 Accurately weigh each bar of soap individually. Cut representative sections from each bar in the form of small thin chips. Mix the chips from each bar thoroughly and keep in an air tight glass bottle. Use this sample for analysis referred to in this appendix and subsequent appendices.

A.2 Weigh accurately about 5 g of the prepared sample in a tared petri dish and dry to constant weight at a temperature of 105°C ± 1degC

A.3 Calculation

Anhydrous soap per bar $= \frac{M_2}{M_1} \times M$

where

M = Average mass in g per soap bar

M_1 = Mass in g of sample before drying.

M_2 = Mass in g of sample after drying.

Note : In case of doubt, the anhydrous soap content of each bar shall be determined separately.

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APPENDIX 'B'

METHOD FOR THE DETERMINATION OF TOTAL FATTY AND ROSIN ACIDS

B.1 Weigh accurately about 5 g of the prepared sample (Appendix A) in a 400 ml beaker and dissolve the sample in 100 ml of distilled water by warming. To the clear soap solution add a few drops of methyl orange indicator and then dilute sulphuric acid in slight excess (as judged by the change of colour of methyl orange indicator) and heat to about 60°C until the fatty acids separate as a clear layer. Cool the contents of the beaker and transfer to a separating funnel. Rinse the beaker several times with 50 ml of freshly distilled diethyl ether in small fractions at a time and transfer all the rinsings to the separating funnel. Shake the separating funnel vigorously to ensure intimate contact between the ether and fatty acids. Transfer the aqueous layer after separation to a conical flask and extract with 50 ml of diethyl ether in a second separating funnel. Collect all the ether extract in the original separating funnel and wash with distilled water until free from mineral acid. Transfer the ether layer to a small tared boiling flask and distill off the solvent. Dry the residue in an oven at about 90°C to constant mass.

B.2 Calculation

$$\text{Total fatty \& rosin acids, percent by mass} = \frac{M_2}{M_1} \times 100$$

where

M_1 = Mass in g of the sample

M_2 = Mass in g of the residue.

APPENDIX 'C'

METHOD FOR THE DETECTION OF ROSIN

C.1 The liberated fatty acids (Appendix B) should not show a positive reaction for rosin when put to either Liebermann-Storch test or Halphen-Hicks test. The details of tests are given below:-

I. Liebermann - Storch test. Take approximately 0.1 g of the fatty acids derived from soap in a test tube and dissolve in 3-4 ml of acetic anhydride by warming. Cool the solution and add a drop of sulphuric acid (relative density 1.5) carefully along the side of the test tube and allow the acid to mix the solution slowly. A blue violet colour fading rapidly, produced at the margin of contact of the reagents indicates the presence of rosin.

II. Halphen-Hicks Test. Take approximately 0.1 g of the fatty acid derived from soap in a test tube and dissolve it in a solution of phenol (1 part) in carbon tetrachloride (2 parts). Transfer a drop or two of this fatty acid solution on to a white spot plate and waft bromine vapour across the surface. A blue colour changing to intense violet indicates the presence of rosin.

APPENDIX 'D'

METHOD FOR THE DETERMINATION OF TITRE OF THE FATTY ACIDS

D.1 Take approximately 50 g of the fatty acid (obtained by the method described in Appendix F) melt it over a water bath maintained at 60°C and pour it into a test tube (size 160 mm long and 35 mm diameter) to half its capacity. Insert a thermometer, graduated in 0.1°C, into the test tube through a bored cork fitted to it, in such a manner that the bulb of the thermometer is centrally placed in the liquid. Place the whole assembly in a wide mouth glass bottle (size 100 mm diameter and 130 mm high) provided with a cork having a central hole through which the test tube can be inserted.

D.2 Note carefully the temperature at which the turbidity commences and solid matter starts to settle. Agitate the material by stirring with the thermometer three times in one direction and three times in the opposite direction and then continuously, taking care to see that the thermometer does not touch the side of the test tube. The temperature first falls, then becomes stationary and then rises a little. The titre point is the highest temperature indicated by the thermometer during this rise.

D.3 If the room temperature is above the titre of the fatty acid place the whole assembly in a bath maintained at a temperature 5°C lower than the approximate titre of the fatty acid.

APPENDIX 'E'

METHOD FOR THE DETERMINATION OF MATTER INSOLUBLE IN ALCOHOL

E.1 Take about 5 g of the prepared sample (Appendix A) in a petri dish and dry it to constant mass at a temperature of 105°C ± 1 degC. Accurately weigh the dried residue and transfer it to a conical flask. Dissolve the dried material by refluxing with 200 ml of ethyl alcohol (95 percent and neutral to phenolphthalein) on a steam bath. Filter the solution hot through a counterpoised filter paper or through a weighed gooch crucible crucible. Wash the residue on the filter paper or in the gooch with hot neutral alcohol until free from soap, dry it at 100°C ± 2degC to constant mass, cool and weigh. (Reserve the filtrate and the residue for the determination of free caustic and carbonated alkali, See Appendix F and G respectively).

E.2 Calculation

$$\text{Matter insoluble in alcohol, percent by mass} = \frac{M_1}{M_2} \times 100$$

where

M_1 = Mass in g of the insoluble residue

M_2 = Mass in g of the anhydrous soap.

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APPENDIX 'F'

METHOD FOR THE DETERMINATION OF 'FREE CAUSTIC ALKALI'

F.1 To the filtrate reserved from the determination of matter insoluble in alcohol (Appendix E) add 0.5 ml of a one percent solution of phenolphthalein. A red colour developed indicates the presence of free alkali. Titrate it against standard 0.1N Hydrochloric acid.

F.2 Calculation

$$\text{Free caustic alkali as } Na_2O, \text{ percent by mass} = \frac{V \times n \times 0.031 \times 100}{M}$$

where

V = volume in ml of the acid required

n = normality of the acid

M = Mass in g of the anhydrous soap.

APPENDIX 'G'

METHOD FOR THE DETERMINATION OF CARBONATED ALKALI

G.1 Take the residue reserved from the determination of total matter insoluble in alcohol (Appendix E) and thoroughly extract it with hot water into flask. To this aqueous extract add 0.5 ml of a one percent solution of methyl orange and titrate it against standard 0.1N hydrochloric acid solution.

G.2 Calculation

$$\text{Free carbonated alkali as } Na_2O, \text{ percent by mass} = \frac{V \times n \times 0.031 \times 100}{M}$$

where

V = volume in ml of the acid

n = normality of the acid

M = mass in g of the anhydrous soap.

APPENDIX 'H'

METHOD FOR THE DETERMINATION OF SODIUM CHLORIDE

H.1 Weigh accurately about 5 g of the prepared sample (Appendix A) in a petri dish and transfer it to 400 ml beaker and dissolve it /soap in 100 ml of distilled water by warming. To the clear/ solution add dilute nitric acid in slight excess (as judged by methyl orange indicator) and heat the contents to about 60°C until the fatty acids separate as a clear layer. Filter through a whatman No. 1 filter paper and wash the fatty acids on the filter paper with /water warm/until free from mineral acid. Transfer the filtrate to a conical flask, add 5 ml of concentrated nitric acid and 20 ml of

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0.1N silver nitrate solution followed by 5 ml of pure nitrobenzene and 5 ml of 10 percent ferric alum solution. Titrate against 0.1N ammonium thio-cyanate solution accurately standardised. Carry out a blank determination simultaneously using the same quantities of reagents.

H.2 Calculation

$$\text{Sodium chloride, percent by mass} = \frac{(V_1 - V_2) \times n \times 0.0585 \times 100}{M}$$

where

V_1 = volume in ml of the ammonium thiocyanate solution required for the blank

V_2 = volume in ml of the ammonium thiocyanate solution required for the experiment.

n = normality of ammonium thiocyanate solution

M = mass in g of the soap sample.

APPENDIX 'J'

METHOD FOR THE DETERMINATION OF MATTER SOLUBLE IN DIETHYL ETHER

J.1 Take in a petri dish about 5 g of the prepared sample (Appendix A) and dry to constant weight at a temperature of 105°C ± 1degC. Weigh accurately the dried residue and transfer it into an extraction thimble and plug loosely with fat free cotton wool. Place the thimble into a soxhlet extractor. Rinse the petri dish twice with 10 ml of neutral diethyl ether and add the ether washings also into the thimble in the extractor.

J.2 Extract the soap in the thimble with neutral diethyl ether for four hours during which time the solvent should siphon at least eight times per hour. Transfer the ether extract in the flask to separating funnel. Wash the flask three times, every time with 10 ml of ether. Make up the total volume of ether to 180 ml and wash with neutral distilled water three times using 50 ml of water each time. Take the ether layer in a clean dry and tared flask. Distil off the ether on a water-bath. Remove the last traces of water present by distilling off with 10 ml of acetone, dry in an oven at 100°C ± 2degC to constant mass and weigh.

J.3 Calculation

$$\text{Matter soluble in diethyl ether} = \frac{M_1}{M_2} \times 100$$

where

M_1 = mass in g of the residue

M_2 = mass in g of the anhydrous soap.

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APPENDIX 'K'

METHOD FOR GELATINIZATION TEST

K.1 Take 5 g of anhydrous soap and dissolve it in 500 ml of distilled water and allow it to stand for 100 hours at a temperature of 32°C ± 5degC. No gelatinisation shall take place during the above period.

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