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PAKISTAN STANDARD SPECIFICATION
FOR
TOILET SOAP (4th REVISION)



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**PAKISTAN STANDARD SPECIFICATION
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0. FOREWORD

- 0.1 This Pakistan Standard (4thRevision) adopted by Pakistan Standards and Quality Control Authority on 30, April, 2018 after the draft finalized by the Oils, Fats, Soaps and Detergents Technical Committee had been approved by the Chemical National Standard Committee.
- 0.2 This Pakistan Standard specification was first established in 1958, first revision in 1985 and secondly revised in 1990, keeping in view the latest development made in the Industries, Committee felt it necessary to revise. It is hoped that this revised standard will assist the production of Toilet Soap and will help in the enhancement of export in foreign market.
- 0.3 In drawing up this standard, the views of the consumers, manufacturers, technologists and testing authorities, have been taken into consideration by the Technical Committee. In addition the valuable assistance derived from British Standard BS: 1914, Specification for Toilet Soap & BS: 1715, Method of Tests ISO 685, with thanks.
- 0.4 In orders to keep abreast with the advancement of additive technology and performance requirement of oil, soap and detergent industries. Pakistan Standards are revised periodically; or when deem necessary. Therefore suggestions from the members and all other stake holders in oil, soap, detergent business are welcome and will be placed before the Technical Committee for future consideration.
- 0.5 All the parameters prescribed in the Table 1 and Clause 5 (Packing and Marking) of this standard, are mandatory for compliance
- 0.6 The purpose of deciding whether the requirements of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis shall be rounded off in accordance with PS: 103 – 1991 “ Method of Rounding of Numerical Value”. The number of signification places retained in the rounded off value should be the same as that of the specified value in this standard.

1. SCOPE

- 1.1 This standard prescribes requirements and methods of sampling and test for toilet soap and does not cover the shampoo and liquid toilet soap.

2. GRADES

- 2.1 Toilet soap shall be of three grades, namely, Grade 1, Grade 2, and Grade 3 with respective grade marking on each pack.

3. TERMINOLOGY:

- 3.1 **TOTAL FATTY MATTER-** It is the sum of fatty acids, rosin acids, glycerides and unsaponified matter. The water-insoluble fatty material obtained by decomposing the soap with a mineral acid under the conditions specified.
- 3.2 **FREE CAUSTIC ALKALI-** It is the sum of free caustic alkali and the free carbonate alkali contents, expressed conventionally as Na₂O.

- 3.3 **MATTER INSOLUBLE IN ETHANOL**- Any foreign matter not dissolved by the procedure specified in this Pakistan Standard.
- 3.4 **SEQUESTERING AGENT**: - A substance having functional characteristics which make it capable both of suppressing the activity of metallic ion and ensuring that these ions remain in solution.
- 4. REQUIREMENT:**
- 4.1 Description:
- 4.1.1 Grade – 1** This is a high grade, thoroughly saponified, milled soap or homogenized soap or both, white or coloured, perfumed and compressed in the form of firm smooth cakes, and shall possess good cleaning and lathering properties.
- 4.1.2 Grade -2** –This is a thoroughly saponified plodded soap of firm and smooth texture: It shall be white or coloured, perfumed and shall possess good cleaning and lathering properties.
- 4.1.3 Grade -3** -This is a saponified soap of firm and smooth texture. It shall be white or coloured, usually red if cresylic acid is added and shall possess good cleaning and lathering properties.
- 4.2. **Ingredients** - All the ingredients used shall be Halal and in addition to perfume and moisture, toilet soap may contain only colouring matter, optical brightening agents, preservatives, medicaments and such additional substances as are declared on the label. All the foregoing materials shall be non-injurious and biologically safe in use with soap.
- 4.2 Odour and Lathering Properties** – The material shall not have any fishy or any other disagreeable odour and shall possess good lathering and cleaning properties.

Table-1: Requirement for Toilet Soap

S.#	Characteristic	Requirement for			Method of Test (Ref. to clause # in PS:406 and or Appendix
		Grade-- 1	Grade- 2	Grade- 3	
1.	Total Fatty matter percent by mass. (min)	76.0	70.0	60.0	A
2.	Total free alkali content as (Na ₂ O) percent by mass, (max.)	--	--	0.5	B
3.	Matter insoluble in alcohol percent by mass, (max.)	3.0	5.0	10.0	C
4.	Free caustic alkali (NaOH) percent by mass (max.)	0.05	0.05	0.05	PS: 406, Cl.- 6
5.	Chloride content (as sodium chloride) Na ₂ O percent by mass, (max.)	1.0	1.0	1.0	PS: 406, Cl -10
6.	Free carbonated alkali, percent by mass, (Max)	1.0	1.0	1.0	D
7	Lather (Min)	280	240	200	E

4.4 CALCULATION OF RESULTS

- 4.4.1 Toilet soap is liable to lose moisture on keeping. The results of analysis in respect of free caustic alkali and matter insoluble in alcohol shall be recalculated in relation to the minimum specified total fatty matter by means of the equation.

Recalculated result =

$$\text{Actual result} \times \frac{\text{Minimum specified total fatty matter}}{\text{Actual totally fatty matter}}$$

5. PACKING AND MARKING:

- 5.1 The packages shall be securely closed and are strong enough to withstand normal usage and transportation. The packages shall be mark with the following particulars.

- a) Name of the product.
- b) Name and address of the manufacture and trade mark, if any
- c) Net weight of content g.(when packed) \pm 1%
- d) List of all ingredients
- e) Any other information that may be required by legislation.
- f) Country of Origin.
- g) Store in cool & dray place.
- h) Date of manufacture / Batch No. /
- i) *. The packages may also be marked with the PSQCA Certification Mark

*. If the C.M. Licence for the use of Standard mark may be granted to manufacturers or producers may be obtained from the PSQCA.

6. SAMPLING:

- 6.1 For the purpose of general precautions, scale of sampling and preparation of test sample shall be as prescribed in Clause-3 of PS: 406.

6.2 Number of Tests

- 6.2.1 Tests for the determination of total fatty matter, free caustic alkali and matter insoluble in alcohol shall be conducted on each of the individual samples separately.

Test for determination of all the remaining characteristics shall be conducted on the composite sample

6.3 CRITERIA FOR CONFORMITY

- 6.3.1 *For individual samples:* For each of the characteristics which has been determined on the individual samples (see 7.2.1) the mean (X) and the rang (R) of the test results shall be calculated as follows:

$$\text{Mean (X)} = \frac{\text{Sum of test results}}{\text{Number of test results}}$$

$$\text{Range (R)} = \text{Difference between the maximum and the minimum value of the test results}$$

- 6.3.2 The lot shall be deemed as conforming to the requirements given in 7.2.1, if the expression $(X - 0.6R)$ is greater than or equal to minimum value given in Table 1, and $(X + 0.6R)$ is less then or equal to maximum value in Table 1.

6.3.3 *For composite sample* : For declaring the conformity of a lot to the requirements of other characteristics determined on the composite sample, the test results for each of the characteristics shall satisfy the relevant requirement.

6.4 TESTS

6.4.1 Tests to evaluate the characteristics of Toilet Soap specified in Table 1, shall be conducted as prescribed in PS: 406. References to the relevant clauses of that standard are given in col 6 of Table

6.4.1 **Quality of Reagents** - Unless specified otherwise, pure chemicals and distilled water (see PS: 593) shall be employed in the tests.

Note – Pure chemical shall mean chemicals that do not contain impurities which affect the results of analysis.

APPENDIX - A

A-0. DETERMINATION OF TOTAL FATTY MATTER CONTENT:

A-1 REAGENTS

During the analysis, the only reagents of recognized analytical reagent grade and only distilled water or water of equivalent purity.

A-1.1 *Acetone.*

A-1.2 *Light petroleum,*- boiling range between 40 and 60⁰C

A-1.3 *Ethanol,*- 95% (v/v) solution, neutralized to the phenolphthalein solution

A-1.4. *Sulphuric acid or hydrochloric acid,*- approximately 1 N standard volumetric solution.

A-1.5 *Sodium hydroxide,*- approximately 1 N standard volumetric solution, standardized using the methyl orange solution as indicator.

A-1.6 *Potassium hydroxide,*- approximately 1 N standard volumetric solution in ethanol.

A-1.7 *Methyl orange,*- 2 g/1 solution.

A-1.8 *Phenolphthalein,*- 10 g/1 solution in ethanol.

A-2 APPARATUS:

Ordinary laboratory apparatus and

A-2.1 *Beaker-* capacity 250 ml, squat form.

A-2.2 *Separating funnels-* capacity 500ml, or

A-2.3 *Extraction cylinder-* capacity 250 ml, diameter 39 mm and 355 mm, fitted with a ground glass stopper.

A-2.4 *Water bath-* Electrified controlled.

A-2.5 *Oven-* capable of being controlled at 103 ± 2⁰C.

A-3 PROCEDURE:

-
- Carry out two determinations on the same sample.
- A-3.1 Test portion.
- A-3.2 Weigh about 5 g of the laboratory sample into the beaker
Determination:
- A-3.2.1 Dissolve the test portion in about 100 ml of hot water.
- A-3.2.2 Pour the solution into one of the separating funnels or into the extraction cylinder and wash the beaker with small quantities of water, adding the washings to the separating funnel or to the extraction cylinder.
- A-3.2.3 Add a few drops of the methyl orange solution and then, from a burette, add, while vigorously shaking the separating funnel or the extraction cylinder, an accurately measured known volume of the sulphuric acid or hydrochloric acid solution until there is an excess of about 5 ml. Cool the contents of the separating funnel or of the extraction cylinder to about 25°C and 100 ml of the light petroleum. Insert the stopper and gently invert the separating funnel or the extraction cylinder, whilst maintaining a hold on the stopper. Open the stopcock of the separating funnel or the stopper of the extraction cylinder gradually to release any pressure, then close, gently shake and again release the pressure. Repeat the shaking until the aqueous layer has become clear, and then allow to stand.
- a) In the case of use of separating funnels
- Run off the aqueous layer into a second separating funnel and extract with 50 ml of the light petroleum. Repeat the process, collect the aqueous layer in a conical flask and combine the three light petroleum extracts in the first separating funnel.
- b) In the case of use of an extraction cylinder.
- Using a siphon, draw off the light petroleum layer as completely as possible into a separating funnel. Repeat the extraction twice with 50 ml of the light petroleum combine the three light petroleum extracts in the separating funnel, transfer the aqueous layer as completely as possible to a conical flask and wash the extraction cylinder with small quantities of water, adding the washings to the conical flask.
- A-3.2.4 Wash the light petroleum extract by shaking with water (about 25 ml) until the washings are neutral to the methyl orange solution. Usually three washings are sufficient.
- NOTE: - Allow each wash to stand for at least 5 min of such a time as is required to give clear lines of demarcation between the layers, before running off the aqueous layer.
- A-3.2.5 After the final washing has been run off; impart a swirling motion to the contents of the separating funnel by rotating it sharply but without inverting it, to removes any water droplets adhering to the sides.
- A-3.2.6 Allow to stand for at least 5 min and run off any separated water.
- A-3.2.7 Collect the washings of the light petroleum extract quantitatively in the conical flask already containing the aqueous layer.

Determination of total fatty matter content

- A-3.2.8 Carefully transfer the washed light petroleum solution to a weighed, flat-bottomed flask, filtering if necessary through a dry filter paper. Wash the separating funnel with two or three small quantities of the light petroleum and filter the washings into the flask, taking precautions to prevent evaporation of the light petroleum during the filtration. Thoroughly wash the filter with the light petroleum, collecting the washings in the flask.
- A-3.2.9 Evaporate of nearly all the light petroleum on the water bath, taking all necessary precaution, and under a slow stream of cold dry air.
- A-3.2.10 Dissolve the residue in 20 ml of the ethanol, add a few drops of the phenolphthalein solution and titrate with the ethanolic potassium hydroxide solution to a faint permanent pink colour. Note the volume used.
- A-3.2.11 Evaporate the ethanolic solution on the water bath. When the evaporation is near completion, rotate the flask in order to distribute the potassium soap in a thin layer on the sides and bottom of the vessel.
- A-3.2.12 Carry out a preliminary drying of the potassium soap by adding acetone (5.1) and evaporating off the acetone on the water bath under a slow stream of cold dry nitrogen or air. Then heat to constant mass in the oven, controlled at 103 ± 2 °C, i.e. until the difference in mass after heating for an additional 15 minutes does not exceed 3 mg. Cool in a desiccator and weigh.

A-4 **EXPRESSION OF RESULTS:**

Method of calculation and formula:

The total fatty matter content is given, as a percentage by mass, by the formula:

$$[m_1 - (V \times T \times 0.038)] \times \frac{100}{m_0}$$

where,

m_0 = is the mass, in grams of the test portion;

m_1 = is the mass, in grams, of the dried potassium soap;

V = is the volume, in milliliters, of the standard volumetric ethanolic Potassium hydroxide solution used for the neutralization;

T = is the exact normality of the standard volumetric ethanolic Potassium hydroxide solution used.

Take as the result the arithmetic mean of the duplicate determinations, rounding the result to the nearest 0.1%.

APPENDIX – B

TOTAL FREE ALKALI CONTENT

B-1 REAGENTS:

During the analysis, use only reagents of recognized analytical reagent grade and only distilled water or water of equivalent purity.

B-1.1 *Ethanol*- 95% (v/v) solution, free from carbon dioxide.

Reflux this solution for 5 min, cool to ambient temperature and neutralize with the ethanolic potassium hydroxide solution in the presence of 4 drops of the phenolphthalein solution per 200 ml of ethanol.

B-1.2 *Sulphuric acid*- approximately 1N standard volumetric solution

B-1.3 *Potassium hydroxide*- approximately 0.1N ethanolic standard volumetric solution.

B-1.4 *Phenolphthalein*- solution of 1 g per 100 ml in 95% (V/V) ethanol.

B-2 APPARATUS:

Ordinary laboratory apparatus and

B-2.1 Conical *flask*, capacity 250 ml, with a conical ground glass joint.

B-2.2 *Reflux condenser*, water-cooled, with a conical ground glass joint at the bottom.

B-3 PROCEDURE

B-3.1 Test portion

Weigh, about 5 g of the laboratory sample into the conical flask.

B-3.2 Determination:

B-3.2.1 Add 100ml of the ethanol solution to the test portion

B-3.2.2 Fit the conical flask to the reflux condenser. Gently heat until that soap is completely dissolved, then add exactly 3.0ml of the sulphuric acid solution and boil gently for at least 10 min. Allow to cool to ambient temperature.

B-3.2.3 Titrate with the ethanolic potassium hydroxide solution in the presence of the phenolphthalein indicator.

B-3.2.4 Carry out two determinations on the same sample.

B-4 EXPRESSION OF RESULTS:

B-4.1 Method of calculation and formulae

The total free alkali content, expressed as a percentage by mass of sodium hydroxide (NaOH) in the case of sodium soaps, is given by the formula:

$$0.040 \times \frac{V_0 T_0 - V_1}{T_1} \times 100$$

The total free alkali content, expressed as a percentage by mass of potassium hydroxide (KOH) in the case of potassium soaps, is given by the formula:

$$0.056 \times \frac{V_0 T_0 - V_1}{T_1} \times 100$$

where

m is the mass, in grams, of the test portion (B.1)

*V*₀ is the volume, in milliliters, of the sulphuric acid solution Used in the determination.

*V*₁ is the volume, in milliliters, of the potassium hydroxide Solution used in the titration;

*T*₁ is the exact normality of the potassium hydroxide solution

*T*₀ is the exact normality of the sulphuric acid solution

The total free alkali may also be expressed in milli equivalents per gram by the formula:

$$\frac{V_0 T_0 - V_1 T_1}{m}$$

Take as the result the arithmetic mean of the duplicate determinations.

APPENDIX - C

C-0 DETERMINATION OF CONTENT OF ETHANOL – INSOLUBLE MATTER

C-1 REAGENT

C-1.1 Ethanol- 95 % (V / V)

C-2. APPARATUS

Ordinary laboratory apparatus and

C-2.1 *Conical flasks*- of capacity 500 ml,. having ground glass necks.

C-2.2 *Reflux condenser*- water-cooled, with a conical ground glass joint at the bottom to fit the conical flasks (5.1).

C-2.3 *Water bath*.

C-2.4 *Oven*- capable of being controlled at $103 \pm 2^{\circ}\text{C}$.

C-2.5 *Analytical balance*- accurate to 0.001 g.

C-3 **PROCEDURE:**

C-3.1 Test portion

Weigh, to the nearest 0.01 g about 5 g of the laboratory sample into a conical flask.

C-3.2 **Determination:**

C-3.2.1 Add 200 ml of the ethanol to the test portion in the conical flask and connect the reflux condenser.

C-3.2.2 Heat to gentle boiling, swirling the order to avoid, as far as possible, material adhering to the bottom of the flask.

C-3.2.3 Dry the filter paper to be used for the filtration of the insoluble matter in the oven, controlled at $103 \pm 20^{\circ}\text{C}$, for 1 hour. Allow it to cool to ambient temperature in a desiccators and weigh it to the nearest 0.001g. Place it in a funnel mounted on a second conical flask.

C-3.2.4 When dissolution of the soap appears to be complete, decant the supernatant liquid on to the filter paper, wash the insoluble matter in the conical flask by decantation with the ethanol, previously heated to near its boiling point, and transfer the insoluble matter to the filter paper with the aid of small quantities of warm ethanol.

C-3.2.5 Wash the filter paper and the residue with the warm ethanol until entirely free from soap. (The final washings should show no appreciable residue on evaporation.).

C-3.2.6 During this operation, it is advantageous to place the conical flask carrying the funnel on the water bath so as to keep the filtrate gently boiling. An independently heated funnel may also be used.

C-3.2.7 All the same time, cover the funnel with a watch glass. By this means, cooling of the wash liquor is avoided and ethanol vapour, which condenses on the watch glass and drops back on the filter paper, completes the washing of the later. Dry the filter paper in air and than place it in the oven, controlled at $103 \pm 2^{\circ}\text{C}$. After 1 hour remove the filter paper, leave it in the desiccator just long enough for it to cool completely to ambient temperature and weigh it. Repeat the operations of drying in the oven, cooling and weighing until the difference in mass between two successive weighing is less than 0.001 g. Note the final mass.

NOTE: - *With certain soaps, especially silicated soaps, the insoluble matter cannot be completely detached from the bottom of the conical flask. In this case, after thoroughly washing the residue with ethanol, dissolve it in a little hot distilled water. Transfer this solution In to the oven controlled at $103 \pm 2^{\circ}\text{C}$. Allow to cool in a desiccator and weigh. Repeat the operation of drying (for periods of 1 hour), cooling and weighing until the difference in mass between two successive weighing is less than 0.001 g. Add this mass to that of the residue on the filter paper*

C-4 EXPRESSION OF RESULTS

C-4.1 Calculation.

The content of ethanol-insoluble matter, expressed as a percentage by mass, is given by the formula :

$$\frac{m}{m_0} \times 100$$

Where

m_0 is the mass, in grams, of the test portion.

m is the mass, in grams, of the residues.

APPENDIX D

Determination of Free Carbonated Alkali

D.0 General

D.1 Outline of the Method: The matter insoluble in alcohol in the soap is dissolved in water and filtered. The water soluble carbonates are estimated by absorbing carbon dioxide gas evolved by reacting with the acid and expressed as sodium carbonate.

D.2 Apparatus

D.2.1 Volumetric Carbonate Apparatus (same as in Fig 1)

D.2.2 Glass beads

D.3 Reagents

D3.1 Hydrochloric Acid – 0.5 N, accurately standardized.

D3.2 Dilute hydrochloric Acid 1: 2 (v/v)

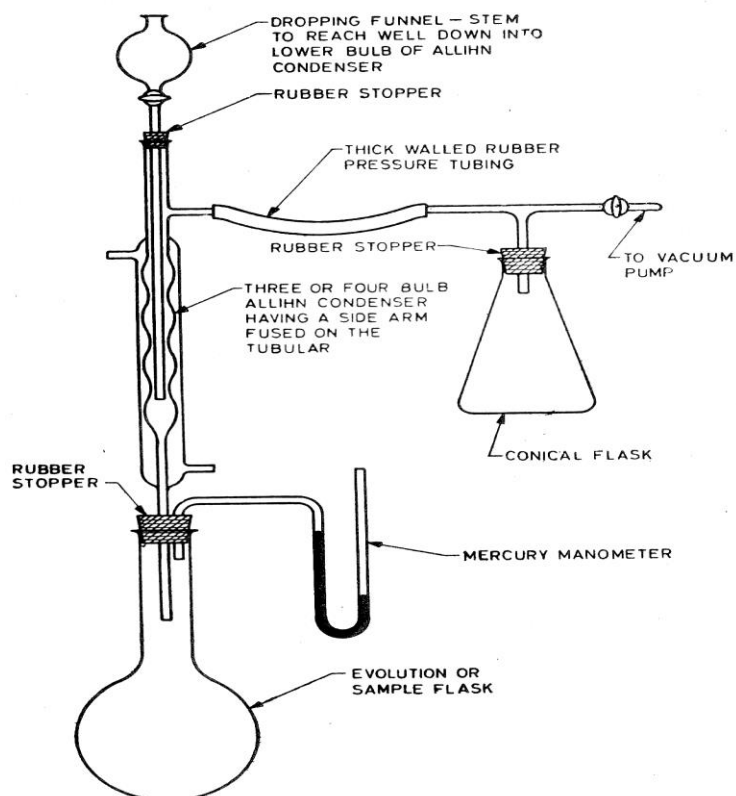
D3.3 Alkaline Absorbent Solution – same as in A3.3.1

D3.4 Magnesium Chloride Solution – 20 percent (m/m)

D3.5 Phenolphthalein Indicator

D3.6 Methyl Orange Indicator

D3.7 Trichlorobenzene



D-4 Procedure

D-4.1 Weigh accurately 2 to 10 g of the sample and digest with 200 ml of freshly boiled ethyl alcohol in a covered vessel on a steam-bath until the soap is dissolved. Filter into a filter flask through a counterpoised filter paper neutral to phenolphthalein, or through a weighed Gooch or sintered crucible with suction, protecting the solution from carbon dioxide and other acid fumes during the operation by covering with a watch glass. Wash it several times with hot ethyl alcohol to remove all the alcohol solubles. After filtering and washing the residue thoroughly with hot ethyl alcohol, change the receiver, extract the residue with successive portions of water at about 60 °C and wash the residue thoroughly on the filter paper on in the crucible.

D-4.2 Weigh sufficient quantity of the sample into the sample flask to yield about 0.2 g carbon dioxide. Add about 400 ml of unboiled water to which have been added 2 ml of alkaline absorbent solution to prevent the loss of carbon dioxide. Heat the flask on a steam-bath until soap is dissolved and cool until the flask is only slightly warm to the hand. Add 30 ml of magnesium chloride solution and a few glass beads to prevent bumping.

D-4.3 Pipette 25 ml of alkaline absorbent solution into the conical flask and assemble the apparatus as shown in Fig 2. Start the water through the condenser. Apply suction to the side tube to evacuate the system and reduce the pressure to 65 to 85 mm as indicated by the manometer.

Caution: Maintain a properly reduced pressure and do not allow air to enter the system at any time during the test)

D-4.4 Add dilute hydrochloric acid containing a few drops of methyl orange indicator through the dropping funnel until the mixture in the flask is acidic (see Note). Avoid a large excess of acid. Add trichlorobenzene through the dropping funnel in the proportion of about 1 ml of every 2 g of the sample.

Note: - Shake the conical flask at frequent intervals from the time the acid is added until the sample flask and the condenser have been filled with water.

D-4.5 Place the small flame of a burner immediately in contact with the bottom of the sample glass and heat continuously for 30 minutes. After this discontinue heating and pour boiled and cooled carbon dioxide free water at 50 °C through the condenser tube to fill the flask and the condenser to just below the side of the arm of the condenser.

D-4.6 Disconnect the conical flask, add one milliliter of phenolphthalein indicator and titrate immediately with 0.5N hydrochloric acid with vigorous agitation until pink colour disappears. Add the acid drop by drop. If it is not possible to titrate immediately, stopper the flask tightly to guard against entrance of air.

D-4.7 Conduct a blank determination in order to establish the equivalent of the alkaline absorbent solution in terms of 0.5N hydrochloric acid and also to correct for any carbon dioxide in the reagents.

D.11 Calculation

$$\text{Free carbonated alkali as sodium carbonate, percent by mass} = \frac{(B - S) \times N \times 5.3}{M}$$

Where

B = volume in ml of standard hydrochloric acid used for the blank

S = Volume in ml of standard hydrochloric acid used for the sample.

N = Normality of standard hydrochloric acid used, and

M = mass in g of the sample taken for the determination of matter insoluble in water.

APPENDIX-E
DETERMINATION OF LATHER

E-1 Apparatus**E-1.1 Kitchen Food Blender**

It consists of a three speed kitchen blender with a glass container of 1000 ml capacity, one 1000 ml and one 500 ml capacity graduated measuring cylinder. (The liquidizer blade type)

E-2 Preparation of Sample**E-2.1 Particle Size Reduction of Sample**

The Toilet Soap bar sample shall be grated through a 1.70 mm sieve (see Note). It may be necessary to clean the sieve more often during grating in the case of bar that are soft and sticky. If the bar is too dry and gets powdery during the grating operation, a second sieving of the gratings through a 500 micron sieve is needed and particles passing through this sieve shall be rejected. The sieved gratings shall be stored in air tight containers before use in lather measurement through this sieve shall be rejected. The sieved gratings shall be stored in air tight containers before use in lather measurements.

NOTE: Reduction of particle size of bars needs a certain extent of skill. A set of sieves as mentioned in the method can be used in conjunction with a food grater. Food graters with opening of various sizes and shales are available and a suitable type should be chosen to grate bars having different stickiness, moisture and other characteristics. The amount of manual pressure applied by operator during the grating operation also decides the average particle size and particle size distribution. With some experience the operator should be able to get particles suitable for use in lather measurement.

E-3 Preparation of Standard Solution

E-3.1 Prepare 1 percent solution of sodium lauryl sulphate in 300 ppm water, (Ca: Mg = 3:2)

E-4 Procedure

E-4.1 Measurement of Lather Volume

100 ml of the solution of sodium lauryl sulphate shall be poured into the blender jar of a mixer fixed with 450 W motor covered and blended on low speed for exactly 60 s. The blender shall be operated at an input voltage of 230 ± 10 V at the low setting (popular kitchen mixer have nearly identical speeds of rotation). The blender jar then shall be held inverted over the 1000 ml or 500 ml capacity measuring cylinder (see Note 1) and any lather adhering to the jar shall be scooped out and allowed to drain. The lather volume shall be measured after leveling off the top surface of the foam.

All experiments shall be carried out at an ambient temperature of $27 \pm 2^\circ\text{C}$ (see Note 2). All apparatus and chemicals involved should also be maintained at the above temperature. The lather volume obtained with 1 percent solution of sodium lauryl sulphate should be 600 ± 100 ml.

NOTES:

- i. If lather volume generated is less than 500 ml, use 500 ml cylinder higher lather volume needs 1000 ml capacity cylinder.
- ii. Measurement of temperature of water drained out of the foam is essential in spite of maintaining a constant environmental temperature. Depending upon the atmospheric temperature prevailing in the laboratory at the time of measurement and the nature of the mixer, the starting temperature of water has to be a few degrees lower or higher than the temperature at which measurement is needed.

E-4.2 Measurement of Lather Volume of Sample

Take 100 ml of 300 ppm hard water in the blender jar and add 5 g of the grated soap bar sample to the water in the blender jar, cover and blend on low speed for exactly 60 s. Pour the lather quickly into the cylinder and measure the lather volume immediately after leveling off the top surface of the foam as in C-4.1 only the top heights should be read.

- E-4.2.1 Repeat E-4.1 and E-4.2 for next two sample. Take three determination for each sample and report the average value (see Note). The value for sodium lauryl sulphate determined during each measurement should be used to normalize the value of the soap bar on the basis of standard at 600 ml

NOTE: Measurement are made on 3 pieces of each sample of Soap bar and measurements shall be repeated three times with each sample. The average of the three measurements on each sample shall be reported as the value for that sample bar. The average of the readings of the three bars shall be reported as the reading for that sample of bars. The reported readings shall be normalized to a sodium lauryl sulphate value of 600 ml

REMARKS: Procedure for normalization of values obtained for lather for the test sample to be provided.

Reference:

In the preparation of this standard references was made to the following:

- *Pakistan Standard PS: 406- 1964, Specification for Methods of Sampling and Testing for Soaps.*
- *British Standard BS: 1914 -1990 Specification for Toilet Soap.*
- *British Standard BS: 1715 – 1989 (Section 2.1) Method for determination of total alkali content and total fatty matter content*
- *British Standard BS: 1715 – 1989 (Section 2.2) Method for determination of total alkali content*
- *British Standard BS: 1715 – 1989 (Section 2.11) Method for determination of ethanol-insoluble matter content*
- *ISO-685-1975 (E)*
- *Kirk-Othmer, Encyclopedia of Chemical Technology, 4th edn., Vol. 22, John Wiley & Sons Incorporation.(Page 297-326)*