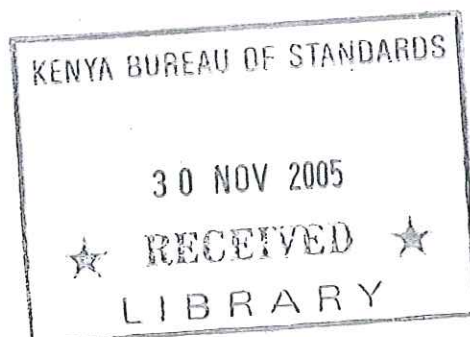


## Bathing bars — Specification



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In order to keep abreast of progress in industry, Kenya standards shall be regularly reviewed. Suggestions for improvement to published standards, addressed to the Managing Director, Kenya Bureau of Standards, are welcome.

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## **Bathing bars — Specification**

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## Foreword

This Kenya standard was developed by the Technical Committee on Soaps and Detergents under the guidance of the Chemical Industry Committee, and it is in accordance with the procedures of the Bureau.

The current Kenya standard on toilet soaps is based on composition. The major concern is that the present compositional standards based primarily on the total fatty matter (TFM) do not necessarily correspond to the performance of toilet soaps. The performance of soaps depends on the type of fatty matter present rather than the total fatty matter in soap. For example, the solubility of soap depends on the characteristics of fatty acids such as chain length, level of unsaturation and on type of cation. Further the use of acceptable non-soap surfactants would result in the substitution of oils and fats, which are scarce resources.

This standard therefore reflects the trends in the latest technological developments while ensuring the performance and safety of the product to the consumer. This will in particular facilitate use of acceptable non-soapy surfactants and structuring aids, some of which are locally available. These will often substitute oils and fats, most of which are imported and expensive, and hence their use can help to boost the country's economy.

The important in-use criteria for bathing bars are safety, cleaning and economy. With regard to safety it is important to guard against the removal of the beneficial skin lipids by the product and over-cleaning resulting in defatting of the skin. This is ensured in the present standard by allowing only surfactants that have a history of safe use in personal washing products. A list of the proposed surfactants is contained in annex A. Other surface-active agents may be added to the list at a future revision if there is adequate evidence of their safety.

The lather requirement is intended to ensure the presence of adequate level of surfactants in the bathing bar for cleaning. The test is designed to take into account dissolution of the bar and subsequent lather generation. The mush test covers the aspect of economy. Limits are prescribed for caustic alkali and alkalinity of alcohol insolubles to restrict the use of alkaline ingredients.

During the preparation of this standard, reference was made to the following document:

IS 13498:1997: Bathing Bar – Specification.

Acknowledgement is hereby made for assistance derived from this source.

## **Bathing bars — Specification**

### **1 Scope**

This Kenya Standard prescribes the requirements and methods of test for bathing bars.

### **2 Application**

This standard applies to bathing bars supplied in the form of cakes and produced from vegetable or animal oils or fats, fatty acids, or from a blend of all or part of these materials, with or without the addition of rosins or non-soapy surfactants.

### **3 Definitions**

For the purpose of this standard the following definition shall apply:

#### **3.1**

##### **bathing bars**

the bathing bar shall be a product containing soap of fatty acids and synthetic surface active agents listed in 4.4.1 as active ingredients and which could be used for bathing purposes in soft and hard water

### **4 Requirements**

#### **4.1 Physical requirements**

**4.1.1** Bathing bars shall be in the form of cakes or bars. The colour of the cake or bar shall generally be uniform, but uniformity of colour shall not be obligatory in the case of genuinely mottled products.

The product shall not be injurious to health if used in a manner and purpose meant for their use or under reasonably foreseen conditions.

##### **4.1.2 Odour**

The cake or bar must not have a wet or dry unpleasant odour.

#### **4.2 Description**

**4.2.1** The bathing bar shall be firm and smooth in texture and shall contain adequate quantity of one or more surface-active agents listed in 4.4.1 and may contain components indicated in 4.4.2.

**4.2.2** They are for personal washing purposes, and primarily contain saponified fatty matter, structurants, preservatives and moisture. They may also contain suitable quantities of colouring matter, perfume, opacifiers and optical brightening agents.

#### **4.3 Performance and safety requirements**

Bathing bars shall also comply with the requirements given in Table 1 when tested against the methods described.

Table 1 — Performance and safety requirements

SL. No	Characteristic	Requirement	Test method
1.	Lather, mL, minimum.	200	Annex B
2.	Mush (loss in mass due mashing on a wet surface) (g/30cm <sup>2</sup> , maximum).	10	Annex C
3.	Freedom from grittiness	To pass the test	Annex D
4.	Total alkalinity (as NaOH) % by mass, maximum.	1.0	Clause 4 of KS 45
5.	Free caustic alkali (as NaOH), % by mass, maximum.	0.05	Clause 5 of KS 45

#### 4.4 Ingredients

4.4.1 The bathing bar shall have one or more of the following surfactants conforming to the relevant Kenya Standard subject to the restrictions indicated:

- There is no restriction on the use of soap of fatty acids, fatty acid ester sulphonates, fatty alkanonamide, fatty alcohol ethoxylates, sarcosinates, taurides, fatty isothionates, alpha olefin sulphonates, alcohol sulphates and amphoterics such as betaines and fatty alcohol ethoxy sulphate, linear alkyl benzene sulphonates (LAS) and alkyl poly glycosides (APG) and fatty alcohol sulphosuccinate and fatty alkanol amido sulphosuccinate.
- Rosins, as % of total fatty matter, shall not exceed 2 %.
- The synthetic surface active agents shall pass the biodegradability test as given in KS 92 - 3: 2004<sup>1)</sup>.

4.4.2 In addition to the surfactants and perfume, the bathing bar may contain other ingredients such as electrolytes, bar structuring and processing aids, colouring matter, permitted antioxidants, preservatives, permissible germicides (See KS 804)<sup>2)</sup>, super fatting agents, humectants and such additional substances as are declared on the label.

4.4.3 All other ingredients except moisture shall be declared on the label.

For guidance, a list of bar structuring and processing aids is given in Annex A. All these materials shall be non-injurious to skin in use with the bathing bar.

4.4.4 The bathing bar shall not contain any material listed as a forbidden material in KS 1474 Part 2<sup>3)</sup> and subsequent amendments.

## 5 Packaging and marking

### 5.1 Packaging

Each cake or bar may be unwrapped or may be wrapped. Unwrapped or wrapped bars may be packed in suitable boxes, packages or cartons to avoid contamination or damage during transportation.

<sup>1)</sup> Method of analysis for soaps.

<sup>2)</sup> Antibacterial soaps – Specification.

<sup>3)</sup> Specification for classification of cosmetic raw materials & adjuncts: Part 2: List of substances which must not form part of the composition of cosmetic products.

## 5.2 Marking

Each bathing bar shall be marked legibly and indelibly with the following particulars:

- i) the words 'Bathing Bar';
- ii) the name and address of the manufacturer and trade mark if any;
- iii) nominal weight of each bar or cake at the time of packaging;
- iv) number of bars or cakes contained in the package;
- v) all ingredients except moisture;
- vi) batch number or code number;
- vii) country of origin.

## 5 Sampling

### 5.1 Scale of sampling

The consignment of bathing bar cakes to be sampled shall be divided into lots, each lot containing about 20 cakes from the same source and of the same declared weight and brand.

From each lot, a sample of 9 cakes shall be drawn at random. The cakes of soap thus chosen shall be kept, until tested, in a clean closed container, marked so as to identify the lot from which they have been chosen.

The cakes shall be tested separately for each of the tests mentioned in Table 1.

This scale of sampling will ensure that there are a further 9 samples remaining with which to repeat any of the tests that give results not conforming to the criteria for conformity, or in the event of a dispute over the results.

## 6 Test methods

### 6.1 Preparation for test samples

The cakes of a given type (brand) of bathing bar shall be packed into a clean airtight container until tested.

The requirements given in Table 1 shall be tested according to Annexes B to D. Testing should commence as soon as possible after sampling.

### 6.2 Criteria for conformity

Criteria for conformity to tests are included in the Annexes B-D describing the individual test methodologies.

**Annex A**  
**(informative)**

**Permitted structuring and processing aids**

Following is the list of structuring and processing aids used generally in bathing bars.

- A.1** Starch and derivatives
- A.2** Cellulose and derivatives
- A.3** Propylene glycol
- A.4** Sorbitol
- A.5** Glycerol
- A.6** Dextrin
- A.7** Kaolin
- A.8** Talc
- A.9** Bentonite
- A.10** Calcite
- A.11** Sodium lactate
- A.12** Soda ash
- A.13** Vegetable/animal oil fatty acids and salts
- A.14** Phosphates
- A.15** Sodium chloride
- A.16** Sodium sulphate
- A.17** Dolomite
- A.18** Fatty alcohol
- A.19** Rosin and rosin salts
- A.20** Fatty acid ethanolamide
- A.21** Diethylene glycol monostearate
- A.22** Paraffin
- A.23** Polyoxyethylene glycol
- A.24** Glycerol monostearates
- A.25** Silicates
- A.26** Any other internationally accepted builder cleared by the Kenya Bureau of Standards



## Annex B (normative)

### Test for lather volume

#### B.1 Principle

The speed of a domestic kitchen blender is adjusted so that when operated for 60 seconds it will deliver  $600 \pm 100$  mL of lather (foam) from a 1 % solution of sodium lauryl sulphate in 300 ppm calcium hardness water at 25 °C.

Soap samples are grated to a uniform noodle of about 2-3 mm diameter (domestic cheese grater). Five grams of the noodles are mixed in the domestic blender for 60 seconds with 100 mL of 300ppm calcium hardness water at 25°C.

The volume of the lather generated from the soap is normalised to a volume of 600 mL delivered from the sodium lauryl sulphate solution tested in the same blender at the same speed.

#### B.2 Equipment/reagents

A variable speed kitchen blender with a container/ jar of at least 1000 mL capacity.

##### B.2.1 Kitchen cheese grater

##### B.2.2 1000 mL measuring cylinder

##### B.2.3 100 mL measuring cylinder

##### B.2.4 Thermometer 0 – 100 °C

##### B.2.5 Water containing 300ppm calcium hardness

To make 2 litres of a 300 ppm hard water dissolve 1.66 g of analytical grade anhydrous calcium chloride in demineralised water and make to 2 litres.

1 % SLS solution in water containing 300 ppm calcium water hardness.

Dissolve 20g of analytical grade sodium lauryl sulphate (SLS) in water and make to 2 litres with the 300 ppm calcium hardness water.

Note especially that this SLS solution should be prepared fresh every day.

#### B.3 Sample preparation

**B.3.1** The requirement is for duplicate lather measurements from three bars of each product, and for six replicate lather measurements from the freshly made solution of sodium lauryl sulphate.

**B.3.2** A sample of the bathing bar is grated to give at least 20 grams of 2 – 3 mm diameter noodles.

Cut-off the end third of the bar before grating the freshly exposed face of the remaining two thirds. This will limit the proportion of over dried surface soap that is converted into noodles.

Immediately place the grated noodles onto a coarse sieve e.g. aperture 850 microns or similar and shake gently to allow any fine and over dried soap to pass through.

Small diameter noodles can lose water very quickly and the gratings should be transferred very quickly from the sieve into a labelled container that can be closed to prevent such water loss.

Duplicate lather determinations on an individual sample of a bathing bar will only require 2 x 5 g samples of the noodles. However, it is always wise to take at least 20 grams to allow for any repeat tests.

#### B.4 Procedure for lather determination

NOTE All tests are to be performed with solutions and equipment at  $25 \pm 2$  °C.

##### B.4.1 Lather volume from standard sodium lauryl sulphate (SLS) solution

B.4.1.1 Pour 100 mL of 1 % SLS solution into the blender, cover the blender jar.

B.4.1.2 Run the blender for exactly 60 seconds.

B.4.1.3 Invert the blender jar over the 1000 mL measuring cylinder and allow to drain. If necessary a long plastic spatula or ruler can be used to scoop the residual foam from the jar into the cylinder.

B.4.1.4 If necessary level the top of the foam with the long plastic spatula or ruler and measure the lather (foam) volume (S).

NOTE The total volume of material in the cylinder is taken as the lather volume. There is no allowance for any liquid that may separate from the actual foam.

B.4.1.5 Measure the temperature of the foam in the measuring cylinder.

B.4.1.6 If the lather volume is not  $600 \pm 100$  mL adjust the blender speed and repeat the test until a volume in this range is achieved.

##### B.4.2 Lather volume from a bathing bar sample

B.4.2.1 Prepare 20g of 2 – 3mm diameter noodles from each sample to be tested, as described in Section B.3.

B.4.2.2 Quickly weigh  $5 \pm 0.05$  g of the grated sample.

B.4.2.3 Add the sample to the blender jar which should contain 100 mL of water with 300 ppm Ca water hardness.

B.4.2.4 Run the blender for exactly 60 seconds.

B.4.2.5 Invert the blender over the 1000 mL measuring cylinder and allow to drain. If necessary a long plastic spatula or ruler can be used to scoop the residual foam from the jar into the cylinder.

B.4.2.6 If necessary level the top of the foam with the long plastic spatula or ruler and measure the lather (foam) volume (\*X)

NOTE The total volume of material in the cylinder is taken as the lather volume. There is no allowance for any liquid that may separate from the actual foam.

B.4.2.7 Measure the temperature of the foam in the measuring cylinder. The target temperature is  $25 \pm 2$  °C. See 4.4.

##### B.4.3 Calculation

The normalised value (X) of lather for the soap sample will be calculated as follows:

$$X = *X \times \frac{600ml}{S}$$

#### B.4.4 Criteria for conformity

The test for lather will give six test results for a given product, obtained from duplicate determinations of the parameter from three samples of the product.

The mean and the range of the corresponding test result shall be calculated as:

$$\text{Mean (X)} = \frac{\text{The sum of test results}}{\text{The number of results}}$$

Range (R) = The difference between the highest and the lowest value obtained for the test results.

The sampled lot of products shall be declared as conforming to requirements for this standard if the expression  $X - 0.6R$  is greater than or equal to the minimum value in Table 1.

#### B.4.5 Notes for guidance

##### B.4.5.1 The kitchen blender

The requirement is for a kitchen food blender operated at a speed, which will deliver a lather volume of  $600 \pm 100$  mL from a standard solution of sodium lauryl sulphate. Commercial blenders may have adequate integral speed controls. Any blender may be operated through an external electronic speed controller or a variable output transformer. Normally the lowest speed will be required from blenders having integral speed control.

##### B.4.5.2 Preparing the noodles

The hole size in the grater should be 2 – 3 mm diameter, but is not critical. The size of holes in a grater can be checked quickly by using a magnifier with a built-in measurement scale, or very simply by inserting the shafts of twist drills into the holes.

A cheese grater with a rotary drum action may be used.

Older soaps may create some dust/ broken noodles during the grating operation. This fine material will have been removed by sieving the noodles immediately after preparation.

Prepared noodles can be kept in a wide top, screw cap, jar or a sealed plastic bag. A sealed plastic bag is less efficient at retaining moisture but is adequate for 1 day. Ideally the samples should be kept in a refrigerator until it is re-equilibrated back to room temperature for about 1 hour before testing.

##### B.4.5.3 Temperature control

All tests should be carried out at  $25 \pm 2$  °C and all apparatus and solutions should be at this temperature.

The temperature of the foam is measured in the measuring cylinder, immediately after the foam volume measurement.

It is not always easy to achieve this level of temperature control. To achieve a foam temperature in the specified range it may be necessary to start with the 300 ppm hard water supply adjusted to a slightly higher or slightly lower temperature than ambient.

**Annex C**  
**(normative)**

**Evaluation of the mashing properties of a bathing bar**

**C.1 Principle**

A test piece of defined size is cut from the sample bar to remove harder outer layers. The test piece is preconditioned by giving 18 x 180 degree twists under running water at 25 °C or in a bowl of water at 25 °C. The bar is left for six hours on a piece of fabric that has been wetted and drained of excess water. During the six hours the soap/ cloth are covered to prevent drying. At the end of the test period mush is removed from the test piece face in contact with the cloth. Weight loss from the test piece is expressed as mush per 30 cm<sup>2</sup> of original surface area in contact with the cloth.

**C.2 Equipment**

**C.2.1 For sample preparation**

- Coarse kitchen cheese grater
- Sharp thin blade knife or carpenters plane
- Callipers or ruler to ensure the sample dimensions

**C.2.1 Other equipment/ materials for the test**

Plastic or non-corrodible trays which are suitable sized for the test piece. Plastic soap dishes 7 x 11 x 2 cm are quite suitable.

Cotton cloth pieces cut and folded to fit as a triple layer inside the trays. Normal, flat weave, cotton sheeting as used for bed sheets will be quite suitable.

**C.3 Bar preparation**

**C.3.1** Three (3) individual bars of a type should be tested. A test piece is cut from each bar. The test piece should if possible have a working face (to be applied to the fabric) of  $6 \pm 1$  cm x  $4 \pm 1$  cm.

All bars in a set must be cut to have the same face size. If the smallest of the range of bars to be tested at a given time is too small to allow a working face within these limits, then all bars should be cut to the maximum size possible from the smallest bar.

The longest axis of the test piece ( $6 \pm 1$  cm) should be from a direction parallel to the longest axis of the original bar sample.

The working face should be a fresh surface from the interior of the bar sample. The face opposite the working face should be identified by making a small hole with a sharp object. This enables the working face to be identified after the preconditioning step.

**C.3.2** To cut the bar it is convenient to first trim it to the approximate size using a coarse kitchen cheese grater and then to make the final adjustments to a smooth surface with a sharp thin-bladed knife or carpenters plane. If a plane is used, it is better to move the bar over the plane blade.

**C.4 Test procedure**

For each test piece

**C.4.1** The tray plus triple thickness of cloth is filled with demineralised water. The tray is then held vertically to drain the water from the cloth. The vertical position is maintained until water ceases to run from the dish in a continuous stream i.e. starts to drip.

**C.4.2** The area of the working face of the test piece is measured (A).

**C.4.3** The working face of the bar is placed onto the damp fabric and then the tray plus soap are covered e.g. with a sealed plastic bag, to prevent water loss.

**C.4.4** The covered test piece and holder are maintained at 25 °C for 6 hours.

**C.4.5** The mushed soap test piece is removed from the tray and is weighed (W1).

**C.4.6** Mush is removed from the working face of the soap test piece by scraping with the edge of a blunt sided spatula or plastic ruler.

**C.4.7** The test piece is reweighed (W2) and the amount of mush removed is calculated as in C.5. The mush is expressed as grams per 30cm<sup>2</sup> of original test piece surface area.

**NOTE** The procedure for weighing the bar and removing the mush will take some minutes. During that time the remaining soaps will continue to form mush. While this time is not critical for a set of three test pieces from a given product, if more than one product is under test it is advised to stagger the start of the test for the second product. This will give adequate time to complete work on the first set before the 6-hour storage time of the subsequent set is completed.

## **C.5 Calculation**

$$\text{Weight of mush (grams)} = W = W1 - W2$$

$$\text{Surface area of bar (cm}^2\text{)} = A = (\text{width} \times \text{breadth})$$

$$\text{Mush} = \frac{W \times 30}{A} \text{ grams per 30 cm}^2$$

## **C.6 Criteria for conformity**

The test is done with three (3) separate samples of each product type, and the mean value from three samples is quoted (X). The range of values (R) is quoted as the difference between the highest and lowest values obtained for a given product type.

The sample lot of products shall be declared as conforming to the requirements for this standard if  $X + 0.6R$  is less than the maximum value given in Table 1.

**Annex D**  
(normative)

**Determination of grittiness in a bathing bar**

**D.1 Procedure**

Either

Hold the soap tablet under a smooth stream of running water at a temperature of 30 °C and gently rub the two sides of the bar on the palm of one hand for one minute each side.

or

Immerse the soap in a bowl containing 5 litres of water at 30 °C and gently rub two opposite bar faces with the palm of one hand for 30 seconds (15 seconds per bar face). Remove the bar from the water and continue to gently rub the two opposite bar faces for a further 30 seconds (15 seconds per face).

Allow the used bar to dry in the open for 4 hours and examine the surface.

A set of 3 samples will be tested for each product.

NOTE 1 Hands will become hydrated and insensitive with prolonged immersion in water. Testers should wait 15 minutes between testing every 3 sets of products (9 grit tests).

NOTE 2 If using a bowl rather than running water use fresh water after testing every set of 3 samples.

**D.2 Criteria for conformity**

The performance criteria are:

During manipulation under running water the washing bar will not have a visibly rough surface and will feel smooth to the touch.

No gritty particles will be observed on the surface of the dried bar 4 hours after the washing test.



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