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General purpose solid soap — Specification

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This African Standard was prepared by the ARSO Technical Harmonization Committee Number 35 on *Surface Active Agents* (ARSO/TC 35).

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Introduction

<Text indicating rationale for the development/harmonization of the standard>

General purpose solid soap — Specification

1 Scope

This Draft African Standard specifies the requirements and test methods for general purpose solid soap used for general cleaning such as dish washing, laundry use, and for personal hygiene.

This standard does not cover baby soaps.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

DARS 1524-1 Cosmetics — Safety of cosmetic products ingredients — Part 1: List of prohibited substances

DARS 1524-2 Cosmetics — Safety of cosmetic products ingredients — Part 2: List of substances which cosmetic products must not contain except subject to the restrictions laid down

ISO 457, Soaps — Determination of chloride content — Titrimetric method

ISO 673, Soaps — Determination of content of ethanol-insoluble matter

ISO 684, Analysis of soaps — Determination of total free alkali

ISO 685, Analysis of soaps — Determination of total alkali content and total fatty matter content

ISO 862, Surface active agents — Vocabulary

ISO 1067, Analysis of soaps — Determination of unsaponifiable, unsaponified and unsaponified saponifiable matter

ISO 4323, Soaps — Determination of chlorides content — Potentiometric method

ISO 16212, Cosmetics — Microbiology — Enumeration of yeast and mould

ISO 21149, Cosmetics — Microbiology — Enumeration and detection of aerobic mesophilic bacteria

ISO 21392, Cosmetics — Analytical methods — Measurement of traces of heavy metals in cosmetic finished products using ICP/MS technique

3 Terms and definitions

For the purpose of this standard the terms and definitions given in ISO 862 and the following shall apply.

ISO and IEC maintain terminological datatbases for use in standards at the following addresses
- IEC Electropedia: available at http:/.www.electropedia.org/
- -ISO online browsing platform: available at http://www.iso.org/obp

3.1
batch
soap manufactured from one boil or, in the case of continuous production processes, the material from a single day's production

3.2
boil
soap from pan or vat
3.3
defective
soap or its container that fails in one or more respects to comply with the appropriate requirements of the specification

3.4
lot
that quantity of soap bar or tablet bearing the same batch identification and from one manufacturer, submitted at any one time for inspection and testing

3.5
unit
bar or tablet of soap with no covering

3.6
unfilled soap
soap not containing fillers.

3.7
built/filled soap
soap containing moderate quantities of builders/fillers.

4 Types

General purpose soap shall be of the following grades and designations:

a) Type I (unfilled soap)

b) Type II (Built or filled soap)

5 Requirements

5.1 General requirements

5.1.1 The product shall be in the form of bars or tablets.

5.1.2 The colour of the product shall be uniform, except for multi-coloured bars or tablets.

5.1.3 The product shall be firm.

5.1.4 Ingredients used in the manufacture of the product such as Perfume, colouring dyes etc shall be in accordance with DARS 1524-1 and DARS 1524-2.

5.2 Specific requirements

The general purpose solid soap shall also comply with the requirements given in Table 1 when tested in accordance with the corresponding test method.

Table 1 — Specific requirements

Characteristics	Type 1	Type 2	Test method
	Requirements		
Free alkali content a (as sodium hydroxide), mass fraction, %, max.	0.1	0.3	ISO 684
or			
Free acid content a (as oleic acid), mass fraction, %, max.	0.5	0.5	ISO 4314
Unsaponified plus unsaponifiable matter content [a], mass fraction, %, max.	1.0	2.0	ISO 1067
Alcohol insoluble matter contents [a], mass fraction, %, max.	2.0	15	ISO 673
Fatty matter content [b], mass fraction, %, min.	62.0	45	ISO 685
Chloride content a (as sodium chloride), mass fraction, %, max.	0.8	1.5	ISO 457/ ISO 4323
Rosin content of fatty matter, mass fraction, %, max.	8.0	15	Annex A and Annex B
Irritation to product	shall not be irritating to normal skin		Annex C
Heavy Metals Lead, mg/kg, max Arsenic, mg/kg, max Mercury, mg/kg, max	 10 2 1		ISO 21392

[a] Corrected to a fatty matter content mass fraction of 62 %.

[b] On the soap as received.

NOTE 1 - The total amount of heavy metals as lead, mercury and arsenic, in combination, in the finished product should not exceed 10 mg/kg.

NOTE 2 - The heavy metals including lead, mercury and arsenic may be as a result of contamination during processing and should not be deliberately added as ingredients.

5.3 Microbiological Requirements

The Microbiological requirements of General purpose solid soap when tested in accordance with the relevant tests in column 3 of Table 2, shall comply with the requirements given in column 2 of Table 2.

Table 2 — Microbiological requirements

1	2	3
Parameter	**Requirements**	**Test method**
Total bacterial count, cfu/g, max.	1000	ISO 21149
Yeast and Mould, cfu/g, max	1000	ISO 16212

6 Packaging and Labelling

6.1 Packaging

6.1.1 Unless otherwise required, general purpose soap shall, when visually examined, be so wrapped as to prevent excessive drying out, contamination of the product, and staining of the wrapper. The flaps of the wrapper shall be properly secured.

6.1.2 The general purpose soap shall be packed in containers that are strong enough to withstand normal usage and transportation. These containers may then be packed in bulk packages. Only soap from the same batch shall be packed together in a container and, when relevant, in a bulk package.

6.2 Labelling

Each container, bulk package and when relevant each wrapper, shall bear in prominent, legible and indelible marking the information required in terms of the relevant national regulations and statutory requirements (see foreword) and the following additional information, as relevant:

a) manufacturer’s name and physical address

NOTE The name, physical address of the distributor/supplier may be added as required.

b) Name of manufacturer including Trade mark if applicable
c) The words "general purpose solid soap"
d) Warning the soap is not recommended for baby use
e) Batch identification/Number
f) Net weight
g) Date of manufacture
h) Best before date
i) Storage instructions
j) List of ingredients
k) Country of origin
l) Usage instruction
m) in the case of containers, the number of bars or tablets; and
n) in the case of bulk packages, the number of containers or of bars or tablets.

7 Sampling

7.1 General

7.1.1 When no information concerning the implementation of quality control or testing during manufacture is available, the following sampling procedure shall be applied to determine whether a lot submitted for inspection and testing complies with the requirements of the standard. The samples so taken shall be deemed to represent the lot for the respective properties. The sampling procedure shall also be used for adjudication in cases of dispute.

7.1.2 Sample for inspection

Draw at random from the lot

a) five containers if the lot is packed in containers of net mass not exceeding 5 kg; and

b) three containers if the lot is packed in containers of net mass greater than 5 kg.

7.1.3 Sample for testing

7.1.3.1 From the containers taken in accordance with 7.1.2, take at random enough soap to provide a laboratory sample of total mass at least 2 kg (take equal quantities of soap from all containers).

7.1.3.2 Place the laboratory sample in clean, dry, air-tight glass or plastics containers clearly marked with the manufacturer's name or trade mark, the batch identification, and the date of sampling.

7.1.3.3 In the case of unwrapped soap, take the sample bars or tablets (as relevant) from the centre of the container.

7.2 Compliance with this standard

Deem the lot to comply with the requirements of this standard if, after inspection and testing of the samples taken in accordance with 7.1.2 and 7.1.3, the samples are found to comply with all the requirements of this standard.

8 Inspection and methods of test

8.1 Inspection

8.1.1 Inspect the containers (and when relevant the wrappers) taken in accordance with 7.1.2 for compliance with the requirements of clause 7.

8.1.2 Visually examine the samples taken in accordance with 7.1.2 for compliance with the requirements given in 5.1 and 5.2.

8.2 Preparation of test specimens

8.2.1 Composite specimen

8.2.1.1 Determine and record the mass of each unit taken in accordance with 7.1.3 (including any material that may have adhered to the wrapper or to the sample container, as relevant). Calculate the average mass.

8.2.1.2 Divide each unit into eight equal parts by cutting it in half along its length and then by cutting the two halves across the width three times. Ensure that all the cuts are at right angles to one another.

8.2.1.3 Completely slice or grate finely two diagonally opposite eighths of each unit.

8.2.1.4 Combine all the slices or gratings in a clean, dry, air-tight glass or plastics container (identified as in 7.1.3.2), and mix thoroughly.

8.2.2 Test specimens

8.2.2.1 Immediately after preparing the composite specimen, take at one time, all the test specimens required for analysis.

8.2.2.2 Weigh out the test specimen required for the determination of free alkali or acid content, and test immediately.

8.2.2.3 Ensure that any pick-up or loss of moisture is reduced to a minimum by carrying out the weighing and the preparation of the test specimens as rapidly as possible.

Annex A
(normative)

Identification of rosin content of fatty mater in soaps

A.1 Scope

This Annex specifies the Halphen-Grimaldi and Liebermann-Storch method for the identification of rosin in fatty matter.

A.2 Reagents

NOTE Use only analytical grade reagents and distilled water.

A.2.1 Acetic anhydride.

A.2.2 Sulphuric acid, density 1.53 g/mL. Cautiously add 97 mL of sulphuric acid (density 1.84 g/mL) to 100 mL of water.

A.2.3 Solution A. Dissolve 10 g of phenol in 27 mL of chloroform.

A.2.4 Solution B. Dissolve 10 mL of bromine in 40 mL of chloroform.

A.3 Procedure

A.3.1 Halphen-Grimaldi method

A.3.1.1 Place one or two drops of the fatty matter, reserved from the determination of fatty matter (ISO 685), in a porcelain basin and add approximately 2 mL of the solution A to dissolve it. Wet the walls of the basin by tilting and turning it and let it stand for a few seconds so that the walls of the basin are covered with a very thin film of the solution.

A.3.1.2 Hold the neck of the flask containing the solution B in such a position that the bromine vapour diffuses into the porcelain dish and comes into contact with the walls. In the presence of rosin a bluish-grey to purple colour develops immediately.

A.3.1.3 Carry out a comparison test with a sample of fatty matter to which 2 % (*m/m*) of rosin has been added.

NOTE Should the colour reaction in A.3.1.2 be masked by other colours, conduct a second qualitative test, using the Liebermann-Storch method.

A.3.2 Liebermann-Storch method

A.3.2.1 Place 1 g - 2 g of the fatty matter in a test tube, add 5 mL - 10 mL of the acetic anhydride, and heat the mixture in a boiling water bath for approximately 3 min. Cool to room temperature and pour 1 mL - 2 mL of the solution into a white porcelain basin.

A.3.2.2 Allow one or two drops of the sulphuric acid to run down the side of the basin. If rosin is present, a violet colour immediately develops where the acid is in contact with the solution. This colour then turns brown on standing.

A.3.2.3 Carry out a comparison test with a sample of fatty matter to which 2 % (*m/m*) of rosin has been added.

Annex B
(normative)

Determination of rosin content of fatty mater in soaps

B.1 Scope

This Annex specifies a method for the determination of the rosin content of fatty matter in soaps.

NOTE 1 Before proceeding with the quantitative determination of rosin, first establish its presence by a qualitative test (see Annex A).

NOTE 2 The following method is not accurate for rosin concentrations below a mass fraction of 5 %.

B.2 Reagents

NOTE Use only analytical grade reagents and distilled water.

B.2.1 Diethyl ether

Free from peroxides.

B.2.2 Sodium chloride

B.2.3 Sodium sulfate

Anhydrous.

B.2.4 Hydrochloric acid solution

Dilute one volume of concentrated hydrochloric acid (density 1.16 g/mL) with two volumes of distilled water.

B.2.5 Sodium hydroxide solution

10 % mass fraction aqueous solution.

B.2.6 Naphthalene-2-sulfonic acid solution

Dissolve 40 g of naphthalene-2-sulfonic acid in 1 L of absolute methanol.

B.2.7 Sodium chloride solution, saturated

Shake an excess of sodium chloride with water at ambient temperature until no more dissolves. Keep the solution over solid sodium chloride.

B.2.8 Sodium chloride solution, 10 %

Dissolve 10 g of sodium chloride in 100 mL of water.

B.2.9 Standard ethanolic potassium hydroxide solution, 0.2 N

B.2.9.1 Preparation

Purify 95 % (by volume fraction) ethanol by boiling 1.5 L of it over 20 g of potassium hydroxide for 1 h under reflux. Distil, discarding the first 50 mL of the distillate and stopping the distillation when approximately 1.3 L have been distilled. Dissolve 12 g of potassium hydroxide in 1 L of the purified ethanol, allow the solution to stand for approximately one week, and then decant the clear supernatant liquid from any potassium carbonate that has precipitated.

B.2.9.2 Standardization

Accurately weigh out approximately 1 g of potassium hydrogen phthalate (previously dried at 110 °C ± 5 °C for 3 h) into a 250 mL Erlenmeyer flask. Add approximately 100 mL of carbon dioxide-free distilled water and three drops to five drops of the phenolphthalein indicator, and swirl gently until the solid has dissolved. Titrate the solution with the standard ethanolic potassium hydroxide solution, until a permanent pink colour is formed.

B.2.9.3 Calculation

Normality of the standard ethanolic potassium hydroxide solution (N):

$$N = \frac{A \times 4.897}{B}$$

where

A is the mass of the potassium hydrogen phthalate, in grams;

B is the volume of the standard ethanolic potassium hydroxide solution used for the titration, in millilitres.

B.2.10 Methyl orange indicator

Dissolve 0.2 g of methyl orange in 100 mL of carbon dioxide-free water.

B.2.11 Phenolphthalein indicator

Dissolve 0.5 g of phenolphthalein in 100 mL of freshly boiled, 95 % (by volume fraction) ethanol.

B.3 Procedure

B.3.1 Preparation of fatty matter

B.3.1.1.1 Weigh out accurately into a 600 mL beaker such quantity of the test sample as contains approximately 40 g of fatty matter and dissolve it in approximately 400 mL of hot water, to which 40 mL of the sodium hydroxide solution has been added.

B.3.1.1.2 Salt out the soap by adding sufficient saturated sodium chloride to the hot solution to saturate it (at ambient temperature) with sodium chloride. Filter the soap quantitatively, and allow it to drain.

B.3.1.1.3 Dissolve the drained soap in approximately 400 mL of hot water, and repeat the salting out and filtering procedure.

B.3.1.1.4 Wash the soap thoroughly with the saturated sodium chloride solution, and proceed in accordance with B.3.1.2.2 to B.3.1.2.7.

B.3.1.1.5 Reserve the combined filtrates and washings for the determination of carbolic acids.

B.3.1.2Other soaps

B.3.1.2.1 Weigh accurately into a 600 mL beaker such quantity of the test sample as contains approximately 40 g of fatty matter.

B.3.1.2.2 Dissolve the soap in approximately 400 mL of hot distilled water, cool the solution, and slowly add an excess of the hydrochloric acid solution. Cover the beaker with a watch-glass and heat the contents until the fatty matter separates into a clear layer, but do not allow the temperature to exceed 60 °C.

B.3.1.2.3 In the cases of liquid and gel soaps, acidify the soap as it is.

B.3.1.2.4 Cool to approximately 25 °C and transfer the contents of the beaker to a separating funnel. Rinse the watch-glass and the beaker with portions of the diethyl ether totalling 100 mL and add them to the separating funnel. Shake the mixture in the separating funnel vigorously for 1 min, and let it stand until the two phases have separated.

B.3.1.2.5 Draw off and discard the aqueous layer and wash the ether extract with 50 mL portions of the sodium chloride solution until the last washing is neutral to the methyl orange indicator.

B.3.1.2.6 Filter the washed ether extract into a 250 mL beaker through a filter paper containing approximately 5 g of anhydrous sodium sulfate, and wash the separating funnel and the filter with small portions of the diethyl ether.

B.3.1.2.7 Evaporate the ether extract plus washings on a warm water bath. When the residue is just dry, heat it rapidly to 130 °C and immediately place the beaker in a desiccator to cool.

NOTE B.3.1.2.2 to B.3.1.2.7 should be completed in the shortest possible period of time, so as to prevent oxidation of the fatty acids.

B.3.2 Determination of rosin content

B.3.2.1 Weigh accurately into a 150 mL flask with a ground-glass joint approximately 2 g of the prepared fatty matter (B.3.1.2.7) and reserve the rest in the case of soap powders for the fatty matter titre determination.

B.3.2.2 Add exactly 25 mL of the naphthalene-2-sulfonic acid solution to the flask and two or three glass beads, and boil under reflux for 30 min.

B.3.2.3 Carry out a blank test at the same time, using exactly 25 mL of the naphthalene-2-sulfonic acid solution only.

B.3.2.4 Cool the contents of both flasks (sample and blank) to ambient temperature, add 0.5 mL of the phenolphthalein indicator to each flask, and immediately titrate to the end point with the standard ethanolic potassium hydroxide solution.

B.4 Calculation

Rosin content of fatty matter, as a mass fraction percentage (R):

$$R = \frac{(A - B) \times N \times 34.6}{C} - 1.0$$

where

A is the volume of the standard ethanolic potassium hydroxide solution used for the titration of the sample solution, in millilitres;

B is the volume of the standard ethanolic potassium hydroxide solution used for the titration of the blank solution, in millilitres;

N is the normality of the standard ethanolic potassium hydroxide solution;

C is the mass of the fatty matter taken, in grams.

Annex C
(normative)

Testing Procedure for Assessment of Skin Irritation Potential in Human Volunteers

C.1 Objective

To assess the skin tolerance and irritation potential of cosmetic ingredients under controlled conditions using a stepwise human volunteer testing approach.

C.2 Pre-Study Requirements

Before initiation of the study:

i. Conduct a full safety assessment by a qualified safety assessor.
ii. Review chemical structure, toxicological data, and related substances.
iii. Confirm that no significant health risk to volunteers is foreseeable.
iv. Ensure compliance with ethical requirements and obtain approval where applicable.
v. Define study objectives, methodology, evaluation criteria, and adverse event management procedures.
vi. Obtain written informed consent from all participants.

C.3 Selection of Volunteers

C.3.1 Inclusion Criteria

i. Healthy informed volunteers meeting study requirements.
ii. Appropriate age, gender, and skin condition.
iii. Agreement to comply with study instructions.

C.3.2 Exclusion Criteria

i. Pregnancy or nursing.
ii. Skin damage, tattoos, scars, or active skin disease at test sites.
iii. Medication or medical history affecting skin response.
iv. Participation in conflicting or recent studies.

C.3.3 Withdrawal Criteria

Participants shall be withdrawn if:

i. Study instructions are not followed;
ii. Illness or adverse reactions occur;
iii. The participant chooses to withdraw.

C.4 Test Materials

i. Prepare test materials at concentrations appropriate for the study objective and expected exposure conditions.
ii. Use suitable vehicles that do not independently cause irritation.
iii. Include reference/control materials where appropriate.

C.5 Test Methods

Testing shall follow a stepwise progression from minimal to increased exposure until the study objective is achieved.

C.5.1 Examples of Test Types

C.5.1.1 Single Application Open Test
Apply material to exposed skin under non-occlusive conditions.

C.5.1.2 Repeat Application Open Test
Repeated applications to evaluate cumulative irritation effects.

C.5.1.3 Closed Patch Test (Occlusive or Semi-Occlusive)
Apply material using patches for defined exposure periods (e.g. 4 h, 24 h, or 48 h).

C.5.1.4 Repeat Application Patch Test
Repeated occlusive applications to assess cumulative irritation potential.

C.5.2 Test Procedure

C.5.2.1 Application

i. Assess baseline skin condition before first application.
ii. Randomize test sites where appropriate.
iii. Apply measured amounts sufficient to cover the test area without overflow.
iv. Maintain consistent patch placement during repeated studies.

C.5.2.2 Exposure Conditions

i. Define exposure duration, concentration, and application type in the protocol.
ii. Increase exposure progressively only if previous stages show acceptable tolerance.

C.5.2.3 Removal of Test Material

Remove materials gently without rubbing to avoid cross-contamination or mechanical irritation.

C.6 Evaluation of Skin Responses

C.6.1 Visual Assessment

i. Assess treatment sites at predefined intervals using a standardized scoring scale.
ii. Evaluate erythema, oedema, dryness, and related skin reactions.
iii. Use the same trained assessor and consistent lighting conditions throughout the study.

C.6.2 Instrumental Assessment

Where applicable, objective measurements may include:

i. Transepidermal Water Loss (TEWL);
ii. Redness intensity measurements;
iii. Laser Doppler flowmetry.

Measurements shall be conducted under controlled environmental conditions with calibrated instruments.

C.7 Data Analysis and Interpretation

i. Perform statistical analyses as specified in the study protocol.
ii. Compare responses of test materials with reference or control materials.
iii. Interpret results based on irritation severity, exposure conditions, and cumulative effects.

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