DRAFT TANZANIA STANDARD

TBS/CDC-2(5795) P3- Household laundry detergent bars – Specification

TANZANIA BUREAU OF STANDARDS
Foreword

This Draft Tanzania Standard was developed by the Soap and Detergents Technical Committee under supervision of the Chemicals Divisional Standards Committee and it is in accordance with the procedures of the Bureau.

In the preparation of this Draft Tanzania Standard assistance was drawn from IS 8180:1992 (Reaffirmed 2016) household laundry detergent bars - Specification; published by the Bureau of Indian Standards.

In reporting the results of analysis of a test if the final value is to be rounded off, it shall be done in accordance with TZS 4 *Rounding off numerical values*
Household laundry detergent bars – Specification

1 Scope

This Draft Tanzania Standard specifies requirements, sampling and test methods for household laundry detergent bars.

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.

TZS 638-1/EAS 377-1 Cosmetics and cosmetic products — Part 1: List of substances prohibited in cosmetic products
TZS 1780/EAS 814 Determination of biodegradability of surfactants — Test method
TZS 1392(Part 2)/ISO 672, Analysis of soap — Determination of moisture and volatile matter content
TZS 1392(Part 3)/ISO 673, Analysis of soap — Determination of ethanol insoluble matter
TZS 610/ISO 2870 Surface active agents — Detergents — Determination of anionic-active matter hydrolysable and non-hydrolysable under acid conditions
FTZS 676-2/ISO 2871-2 Surface active agents — Detergents — Determination of cationic-active matter content — Part 2: Cationic – active matter of low molecular mass (between 200 and 500)
TZS 1396-3/ISO 673, Soaps — Determination of content of ethanol-insoluble matter
ISO 862, Surface active agents — Vocabulary
TZS 625/ISO 4313 Washing powders - Determination of total phosphorus (V) Oxide content - Quinoline phosphomolybdate gravimetric method
FTZS 646/ISO 4316 Surface active agents - Determination of pH of aqueous solutions - Potentiometric method

3 Terms and definitions

For the purposes of this standard, the terms and definitions given in ISO862 shall apply.
4 Requirements

4.1 General requirements

4.1.1 Laundry detergent bar shall be free from visible dirt and other foreign matter.

4.1.2 Laundry detergent bar shall be of firm texture and possess good lathering and cleaning properties.

4.1.3 Laundry detergent bar shall be free from objectionable odour. It shall not leave objectionable odour on clothes after washing and thoroughly rinsing with water.

4.1.4 When coloured laundry detergent bar is used in washing any safe white fabric, it shall not leave any visible stains on the fabrics after washing and thorough rinsing with water when tested in accordance with Annex A.

4.1.5 When immersed in distilled water for one hour at 25 °C – 30 °C, laundry detergent bar shall not disintegrate, and when dried at room temperature for 25 h thereafter, it shall not crumble, crack or break.

4.1.6 All the ingredients used in the product shall comply with the requirements of all parts of TZS 638

4.2 Specific quality requirements

Laundry detergent bar shall also comply with the specific quality requirements given in Table 1, when tested in accordance with the method prescribed therein.

<table>
<thead>
<tr>
<th>S/No</th>
<th>Characteristic</th>
<th>Requirement</th>
<th>Method of test</th>
</tr>
</thead>
<tbody>
<tr>
<td>i)</td>
<td>Moisture and volatile matter content at 105 °C, % by mass, max.</td>
<td>30</td>
<td>TZS 1392-2</td>
</tr>
<tr>
<td>ii)</td>
<td>Active ingredient, % by mass, min.</td>
<td>20</td>
<td>TZS 610</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TZS 676-1</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>TZS 676-2</td>
</tr>
<tr>
<td>iii)</td>
<td>Matter insoluble in alcohol, % by mass, max.</td>
<td>90</td>
<td>TZS 1392-3</td>
</tr>
<tr>
<td>iv)</td>
<td>Phosphate (expressed as sodium tripoly-phosphate), % by mass of matter insoluble in alcohol, max.</td>
<td>15</td>
<td>TZS 625</td>
</tr>
<tr>
<td>v)</td>
<td>pH of 1% solution (m/v), at 25 °C ± 2 °C</td>
<td>9 - 11</td>
<td>TZS 646</td>
</tr>
<tr>
<td>vi)</td>
<td>Non-detergent organic matter, % by mass, max.</td>
<td>1.0</td>
<td>Annex E</td>
</tr>
<tr>
<td>vii)</td>
<td>Matter insoluble in water*, % by mass, max.</td>
<td>5.0</td>
<td>Annex C</td>
</tr>
<tr>
<td>viii)</td>
<td>Available O₂ as sodium perborate, %, max</td>
<td>10</td>
<td>Annex D</td>
</tr>
<tr>
<td>ix)</td>
<td>Biodegradability test</td>
<td>To pass the test</td>
<td>TZS 1780</td>
</tr>
</tbody>
</table>

* For the case of non-phosphate-based laundry detergents, MIW shall be 15 % by mass, max.
5 Packaging and labelling

5.1 Packaging

Laundry detergent bar shall be packed in clean and dry containers made of a material, which does not affect
the product and which protects the product from excessive loss of moisture and shall be free from
contamination.

5.2 Labelling

Each bathing bar pack shall be legibly and indelibly labelled either in English or Kiswahili or combination or any
other language as agreed between the manufacturer and supplier with the following information:

a) name of the product as 'laundry detergent bar';
b) manufacturer's name and physical address;
c) country of origin;
d) recognized trade mark (if any);
e) net content;
f) batch number or code number;
g) date of manufacture and best before date; and

6 Sampling

Sampling shall be done in accordance with Annex B.

7 Criteria for conformity

The lot shall be deemed to comply with the requirements of this standard if, after inspection and testing, the
requirements of Clause 4 and Clause 5 are satisfied.
Annex A
(normative)

Determination of staining test of laundry detergent bar

A.1 Method 1: Undissolved powder (5.0 % product concentration)

A.1.1 Principle

Test pieces of cloth of defined area are rubbed with soap and then dipped in water overnight then scrubbed and rinsed in running water.

A.1.2 Materials

Pieces of white cotton, nylon and Crimping C cloth

A.1.3 Procedure

A.1.3.1 Rub evenly about 10 g of soap over a 15 cm x 7.5 cm test swatch placed on a china plate.

A.1.3.2 Pour gently 50-mL of hot water (approximately 55 °C) into the plate so that the test swatch is covered and left overnight (16 h).

A.1.3.3 Hand rub the swatch 10 times and then rinse each of the three test swatches are rinsed twice in about two litres of water and then dried in the drier.

NOTE The staining test is conducted in triplicate for all cloth types.

A.2 Method 2: Pre-dissolved soap (2.5 % product concentration)

A.2.1 Principle

The method involves subjecting fabrics to prolonged soaking in a highly concentrated soap solution.

A.2.2 Materials

Pieces of white cotton, nylon and Crimping C cloth of dimension 15 cm x 7.5 cm

A.2.3 Procedure

A.2.3.1 Weight 10 g of soap in a honey jar and then add 200 mL of hot water at a temperature of approximately 60 °C, shake until when the soap is thoroughly dissolved.

A.2.3.2 Place a test swatch A 15 cm x 7.5 cm in the soap solution (A.2.3.1) and allow standing overnight.

A.2.3.3 Transfer the test swatch in a bowl containing one litre of water and then agitate vigorously by hand for 10 s.

A.2.3.4 Rinse the test swatches in 5 L of water by hand. The times should be fixed for all washes, and then dry swatches.

NOTE The staining test should be conducted in triplicate for all cloth types.
Annex B
(normative)

Sampling of laundry detergent bar

B.1 Procedure

B.1.1 In a single consignment, all packages (cartons) containing laundry detergent bars drawn from the same batch of production shall constitute a lot. For ascertaining the conformity of the lot to the requirements of this standard, tests shall be carried out on each lot separately. The number of packages to be selected for drawing the sample shall be in accordance with Table B.1.

<table>
<thead>
<tr>
<th>Number of packages (cartons) in the lot</th>
<th>Number of packages (cartons) to be selected</th>
<th>Number of samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>4 to 15</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>16 to 40</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>41 to 65</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>66 to 110</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>111 and above</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

B.1.2 The packages shall be selected at random, using tables of random numbers. If these are not available, the following procedure shall be applied:

Starting from any package, count all the packages in one order as 1, 2, 3,... $N$, selecting every $k$ package, where $k$ is the integral part of $N/n$.

B.1.3 From each package thus selected, draw at random an equal number of bars so as to obtain a total mass of at least 2 kg.

B.2 Preparation of test samples

B.2.1 Composite sample

Weigh each cake separately (including any material that may have adhered to the wrapper), and calculate the average mass. Cut each of the remaining cakes into eight parts by means of three cuts at right angles to each other through the middle. Grate finely the whole of two diagonally opposite eighths of each specimen. Mix the gratings and place in a clean, dry, airtight glass container.

B.2.2 Samples for testing

Immediately after preparation of composite sample (B.2.1), take at one time all test samples required for the tests in 4.2. Weigh out the test sample required for determination of free alkali or acid content, and use it immediately.
Annex C
(normative)

Determination of matter insoluble in water

C.1 Procedure

C.1.1 Starting with a fresh portion of the material, weigh accurately about 5 g of the material into a beaker, and digest with 50 mL of ethyl alcohol by heating on a steam bath for about 2 min. Stir and break up any hard lump with a glass rod flattened at one end. Allow the solid matter to settle and decant the hot alcoholic solution through a sintered glass filter funnel fitted to a Buchner flask, to which suction is applied. Repeat the alcoholic digestion in a similar manner with five further consecutive 30-mL portions of boiling ethyl alcohol. Filter each extract in turn through the same sintered glass funnel and, finally, wash the residue several times with hot ethyl alcohol to remove all the alcohol solubles. Dry the sintered glass funnel with the residue in an air-oven at a temperature of 105 °C ± 2 °C until a constant mass is obtained.

C.1.2 Even after digestion with five 30-mL portions of boiling ethyl alcohol, the alcohol insoluble portion may sometimes be found to be sticky. In that case, treat it further with more boiling ethyl alcohol until it is free from active matter and the alcohol insoluble portion is no longer sticky. Do not dry or weigh the matter insoluble in alcohol. After filtering and washing the residue thoroughly with hot ethyl alcohol, change the receiver, extract the residue with successive portions of distilled water at about 60 °C, and wash the residue several times to remove all the water solubles. Dry the sintered glass funnel with the residue in an air-oven at a temperature of 105 °C ± 2 °C until a constant mass is obtained.

C.2 Calculation

The matter insoluble in water is expressed as follows:

$$\text{Matter insoluble in water, \% by mass} = 100 \frac{m_1}{m}$$

where

- $m_1$ is the mass, in grams, of matter insoluble in water; and
- $m$ is mass, in grams, of material taken for the test.
Annex D
(normative)

Test method for perborate

D.1 Method

Weigh 1.5 g to 2 g of sample, dissolve in water and make up to exactly 250 mL. Take an aliquot of 25 mL for titration and add 20 mL of 0.1 M sulphuric acid. Titrate immediately with standard 0.1 N potassium permanganate until a faint pink colour persists.

D.2 Calculation

The available oxygen shall be expressed as follows:

\[
\text{% available oxygen} = \frac{a \times 0.8 \times N}{W}
\]

Where;

- \(a\) is the titre;
- \(N\) is the normality of potassium permanganate;
- \(W\) is the weight of material in aliquot.

NOTE: When fresh contains approximately 95% corresponding to 9.9% available oxygen.
Annex E
(normative)

Determination of non-detergent organic matter

E.1 General

The term non-detergent organic matter includes hydrocarbons, fatty alcohols and perfumes. Using petroleum ether and under the conditions prescribed, non-detergent organic matter only is extracted leaving any alkylolamide present in the material.

E.2 Apparatus

E.2.1 Evaporating basin
E.2.2 Separating funnels, 1000 mL capacity
E.2.3 Wide mouthed flat-bottomed flask, 200 mL capacity
E.2.4 Buchner flask, 500-mL capacity fitted with a sintered glass filter funnel (porosity 4)

E.3 Reagents

E.3.1 Ethyl alcohol, 50 %, 70 %, 90 % and 96 % (by volume)
E.3.2 Petroleum ether, boiling range 40 °C to 60 °C non-volatile residue at 80 °C maximum 0.001 %
E.3.3 Acetone, non-volatile residue at 80 °C maximum 0.001 %

E.4 Procedure

E.4.1 Weigh accurately about 5 g of the material in a 150 mL squat beaker. Extract with 50 mL of hot 90 % ethanol by heating on the steam bath for about 2 min stirring and breaking up any hard lumps with a glass rod flattened at the end.

Allow the solid matter to settle and decant the hot alcoholic solution through a sintered glass filter funnel (porosity 4) fitted to a 500-mL Buchner flask to which suction is applied. Repeat the extraction in a similar manner with five further consecutive 30-mL quantities of boiling 90 % ethanol. Pass each extract in turn through the filter into the flask.

E.4.2 Transfer quantitatively all the combined filtrate from the Buchner flask to a 1 L separating funnel and rinse the flask four times with 40 mL quantities of distilled water, transferring each wash in turn to the separating funnel. Add 100 mL of petroleum ether, swirl gently to ensure adequate mixing and allow the two phases to separate. Run off the aqueous alcoholic layer into a second separating funnel, and extract with 75 mL of petroleum ether. Repeat the extraction of the aqueous alcoholic phase in the third separating funnel with a further 75 mL of petroleum ether. Combine the three ether extracts in the first separating funnel. Rinse each of the two empty funnels with a few millilitres petroleum ether and add the rinsing to the combined ether extracts.

E.4.3 Wash the combined ether extracts and rinsing (see E.4.2) with four successive 50-mL portions of 70 % ethyl alcohol, shaking and removing the alcoholic phase each time. Transfer the ether layer in stages to a tared flask and evaporate off the solvent. Add 10 mL of acetone and evaporate off the solvent. Rotate the flask on a steam bath during the operation. Cool the flask to about 60 °C to 65 °C, gently blow out the last traces of solvent with a current of dry air, cool in a desiccators and weigh.
E.5 Calculation

The non-detergent organic matter is expressed as follows:

\[
\text{Non-detergent organic matter, } \%, \text{ by mass} = 100 \frac{m_1}{m}
\]

where

- \( m_1 \) is the mass, in grams, of the non-detergent organic matter in the flask; and
- \( m \) is the mass, in grams, of the material taken for the test.