DRAFT EAST AFRICAN STANDARD

Toilet cleaner — Specification — Part 2: Solid

EAST AFRICAN COMMUNITY

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Foreword

Development of the East African Standards has been necessitated by the need for harmonizing requirements governing quality of products and services in the East African Community. It is envisaged that through harmonized standardization, trade barriers that are encountered when goods and services are exchanged within the Community will be removed.

The Community has established an East African Standards Committee (EASC) mandated to develop and issue East African Standards (EAS). The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the public and private sector organizations in the community.

East African Standards are developed through Technical Committees that are representative of key stakeholders including government, academia, consumer groups, private sector and other interested parties. Draft East African Standards are circulated to stakeholders through the National Standards Bodies in the Partner States. The comments received are discussed and incorporated before finalization of standards, in accordance with the Principles and procedures for development of East African Standards.

East African Standards are subject to review, to keep pace with technological advances. Users of the East African Standards are therefore expected to ensure that they always have the latest versions of the standards they are implementing.

The committee responsible for this document is Technical Committee EASC/TC 074, *Surface active agents.*

Attention is drawn to the possibility that some of the elements of this document may be subject of patent rights. EAC shall not be held responsible for identifying any or all such patent rights.

Toilet cleaner — Specification — Part 2: Solid

1 Scope

This draft East African Standard specifies the requirements, sampling and test methods for toilet cleaners inform of powder, blocks, tablets and balls.

it applies to acidic and alkaline based solid toilet cleaner for cleaning toilet surfaces, bowls and urinals. It is not intended for use on metal or enamelled fixtures.

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.

ISO 607, Surface active agents and detergents — Methods of sample division

ISO 862 Surface active agents — Vocabulary3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:
— ISO Online browsing platform: available at http://www.iso.org/obp

- IEC Electropedia: available at http://www.electropedia.org/.

4 Requirements

4.1 General requirements

4.1.1 The product shall be supplied in form of powders, granules, blocks, tablets or crystal balls, as applicable.

4.1.2 Products in powder or granular form shall be uniform, free flowing, and free from foreign matter, and shall not be caked in the container when received.

4.1.3 Products in blocks, tablets or crystal balls form shall be of uniform shape and composition, free from visible defects and foreign matter, and shall retain their integrity under normal conditions of handling and storage.

4.1.4 The product may contain suitable abrasives.

4.1.5 The product may be colored and/or perfumed

4.1.6 The product shall contain a surface active agent to accelerate the cleaning action of the product. The surface active component of the material shall be biodegradable.

4.2 Specific requirements

4.2.1 The product shall comply with the specific requirements given in Table 1, when tested in accordance with the test methods specified therein

Table 1 — Specific requirements for acidic toilet cleaner

S/N	Characteristic	Requirement	Test method
i.	Acidity (as H_2SO4), % m/m, min.	17	Annex A
ii.	Iron content, % m/m, max.	0.15	Annex B
iii.	Matter insoluble in water, % m/m, max	5	Annex C
iv.	Surface tension of 2% solution at 25 °C,dynes/cm, max	35	Annex D
v.	pH, max.	3	Annex E
vi.	Cleaning efficiency	To pass test	Annex F
vii.	Effect on porcelain enamel	To pass test	Annex G
viii.	Loss on drying mass, %m/m, max	5	Annex H

Table 2 Specific requirements for alkaline based toilet cleaners

S/No	Characteristic	Requirement	Test method
i.	Surface active content, % m/m, min. As alkylarylsulphonate[1] either or (surface active)	2.0	ISO 2268 for non-ionic and ISO 2271 for anionic matter
ii.	Volatile matter at 105 °C± 2 °C.% m/m, max.	4.0	Annex K
iv.	Content of alkali salts (as Na_2CO3), % m/m	12.0 - 16.0	Annex J
v.	Matter insoluble in water, % m/m, max	5	Annex C
vii.	pH of 1 % solution, min.	9	Annex E
viii	cleaning efficiency	To pass test	Annex F

4.2.3 Storage properties

The product shall conform to the requirements of this standard throughout its shelf-life, from the date of manufacture, when stored in its original sealed container at ambient temperatures.

5 Packaging

The product shall be packaged in suitable containers that are securely closed, are impervious to the material, are not corroded by the material and are sufficiently strong to prevent leakage and contamination of the product arising from the ordinary risks on transportation, handling and storage.

If the lid is perforated, the holes shall be sealed but shall be easy to open. The holes shall be resealable after every use and shall be of such a size that the material flows freely through them.

6 Labelling

6.1 Each package shall be legibly and indelibly labelled in English and/or any other official language (French, Kiswahili, etc.) used in the importing East African Partner State with the following information:Name of the product as “Toilet cleaner";

i) Indication whether acidic or alkaline
ii) Name and address of the manufacturer and/or registered trade mark, if any.
iii) Country of origin
iv) Batch or lot number
v) date of manufacture
vi) Best before date
vii) Net weight of contents.
viii) Number of balls or blocks or tablets in a container, for toilet balls, tablets and blocks
ix) Direction for use.
x) Hazard & Precautionary statements, hazard pictogram/symbols and signal words
xi) List of ingredients
xii) Storage conditions; and
xiii) Disposal instructions

7 Sampling

Sampling shall be done in accordance to ISO 607

Annex A
(Normative)

DETERMINATION OF ACIDITY

A-1 Reagents

A-1.1 Standard Sodium Hydroxide Solution — 0.1 N.

A-1.2 Methyl Red Indicator Solution Dissolve 0.05 g of methyl red in 100 ml of water.

A-2 Procedure

Weigh accurately 50 g of the product into a 500 ml beaker and add 250 ml demineralized water and stir to dissolve the product. Transfer the solution to 500 ml standard flask. Rinse the beaker with demineralized water and make up the volume to 500 ml. Pipette out 10 ml of this solution into a 250-ml conical flask and add 50 ml of demineralized water. Titrate with 0.1N NaOH Solution until the colour changes from pink to yellow, using methyl red indicator.

A-3 Calculation

Acidity = $V \times N$

where

V = volume, in ml, of standard sodium hydroxide solution used in titration; and

N = normality of standard sodium hydroxide solution used.

Annex B
(Normative)

DETERMINATION OF IRON CONTENT

The iron content may be determined using either of the following two methods:

B.1. ATOMIC ABSORPTION SPECTROPHOTOMETER

If this equipment is available, proceed as follows:

Dissolve 1.0 g of the sample in 60 mL of water and 20 mLof hydrochloric acid and boil gently for 10 min. Cool and dilute to 100 mL. Filter with a medium filter paper No. 540.

Determine the iron content using the atomic absorption spectrophotometer.

Express results as per cent iron by mass.

In the absence of an atomic absorption spectrophotometer, the iron content may be estimated as follows:

Dissolve 5 g of the sample in 60 mL of water and 20 mL of hydrochloric acid and boil gently for 10 min. Cool and dilute to 100 mL. Filter with a medium filter paper No. 540. In the same way prepare a reference standard containing 0.75 mg of iron. Dilute 10 ml of each solution to 50 mL and add 30 mg to 50 mg of ammonium persulphate crystals and 3 ml of ammonium thiocyanate reagent solution (prepared by dissolving 25 g ammonium thiocyanate in distilled water to make 100 ml). Compare the two solutions. Any red colour in the sample solution shall not exceed that in the reference standard solution.

Annex C
(Normative)

DETERMINAITON OF MATTER INSOLUBLE IN WATER

Accurately weigh 50 g of the sample and dissolve in 300 ml of hot distilled water in a 500-ml beaker. Allow the insoluble matter to settle, and filter by decanting through a tared weighed Gooch crucible. Wash the insoluble matter into the crucible with more hot water. When the insoluble matter is completely filtered, place the crucible in an electric oven at 105 ± 5 o for 1 h. Cool in a desiccator and reweigh. Repeat the process to constant weight. Calculate as follows:

$$\text{Per cent insoluble matter} = \frac{\textit{mass of residue x } 100}{\textit{mass of sample}}$$

Annex D
(Normative)

DETERMINATION OF SURFACE TENSION

D1. APPARATUS
Du Nuoy tensiometer or interfacial tensiometer or equivalent.

D2. METHOD

Prepare 100 mL of distilled water solution of the compound at the concentration specified (2 per cent solution). Determine the surface tension of the solution at 25 °C in accordance with the instructions supplied with the instrument.

D3. REPORT

Report the surface tension in dynes per centimetre.

Annex E

(normative)

Determination of pH

E.1 Apparatus

E.1.1 100-mL beaker

E.1.2 1-mL pipette

E.1.3 Calibrated pH meter

E.1.4 demineralised/distilled water

E.2 Procedure

E.2.1 Add 100 ml of demineralised/distilled water to a 1mL aliquot of the test solution (see A.2) to be pipetted out into a 100 ml beaker.

E.2.2 Stir well and then check the pH using the previously calibrated pH metre.

Annex P

(normative)

Test for cleaning efficiency

F.1 Apparatus and reagents

F.1.1 Unglazed porcelain streak plate

F.1.2 Ferric Chloride Solution — 5.0 % of the anhydrous salt.

F.2 Procedure

F.2.1 Take the porcelain plate and wet one side with ferric chloride solution. Set the stain by baking at 130°C for 2 hours.

F.2.2 Sprinkle the sample powder over the stain to cover the stain and put few drops of water to wet the powder and allow the sample to react for 5 minutes and gently wipe off. Note the colour of the plate. The original white appearance of the plate should be restored.

Annex G
(normative)
Test for effect on porcelain enamel

G.1 Apparatus

New 70 mm × 70 mm white porcelain acid resistant enamelled steel plate. The enamelling shall be 1 mm.

G.2 Procedure

Place approximately one gram of diatomaceous earth on the plate (see G.1) to make a 16 mm diameter circle with a depth of 10 mm, place 2 g of the sample over the diatomaceous earth circle, and put few drops of water to wet the same. Cover the wetted area with a watch glass and set aside for 16 hours. At the expiry of 16 hours, wash using a rag or sponge, dry the plate and examine with a 5-× magnifying glass for any etching by comparing with a new plate, under good lighting conditions.

Annex H
(normative)

Test for loss on drying mass

H.1 Procedure

Take one gram of the sample in a previously weighed petri dish. Heat at 105 ± 2°C for 1 hour. Cool and weigh. Repeat the heating and cooling until the last two weighings differ by not more than 1 mg.

H.2 Calculation

The loss on drying mass expressed as, %m/m, shall be calculated using the formula

$$= \frac{B \times 100}{A}$$

Where,

B = loss, in g, of mass; and

A = mass, in g, of the sample taken

Annex J
(normative)

Determination of alkaline salt

J.1 Principle

After extracting the composite sample with hot neutralised ethanol, the residue is extracted with a known volume of water which is titrated with hydrochloric acid solution.

J.2 Reagents and materials

J.2.1 Ethanol, 95 % (V/V) solution, free from carbon dioxide. Reflux this solution for five minutes, cool to ambient temperature and neutralise with the ethanolic potassium hydroxide solution (C.2.2) in the presence of four drops of phenolphthalein solution (C.2.3) for 200 mL of ethanol.

J.2.2 **Potassium hydroxide**, 0.1M ethanolic standard volumetric solution

J.2.3 **Phenolphthalein**, solution of 1 g per 100 ml in 95 % (v/v) ethanol

J.2.4 **Hydrochloric acid**, 0.25 M standard volumetric solution

J.2.5 Screened methyl orange indicator, dissolve 0.2 g of methyl orange and 0.28 g of xylene cyanole FF in 100 Ml of freshly boiled 50% (v/v) ethanol and filter

J.2.4 Glass fibre filter, having about the same retention as a Whatman No 5-cellulose filter and about the same speed as a Whatman No. 4 cellulose filter

J.3 Procedure

J.3.1 Weigh to the nearest 0.001 g, 5 g of the sample into a 250-mL beaker, add 50 mL of hot ethanol and boil gently for five minutes. Filter the hot solution through the weighed fibre filter in a filter funnel and transfer the residue quantitatively to the filter. Wash the residue with 150 mL of hot ethanol.

J.3.2 Extract the residue on the filter with sufficient boiling water to collect 200 mL of extract. Reserve the extracted residue for the determination of water-insoluble matter (Annex D). To the water extract obtained above add about 0.5 mL of the screened methyl orange indicator and titrate with the standard hydrochloric acid solution until the colour changes from green to grey. Carry out this determination induplicate.

J.4 Calculation

J.4.1 The alkaline salt content, expressed as percent by mass of anhydrous sodium carbonate, shall be calculated as follows:

$$\frac{V \times M \times 5.3}{m_0}$$

where

m_0 is the mass, in grams, of sample used;

M is the molarity of the standard hydrochloric acid solution;

V is the volume, in millilitres, of the hydrochloric acid solution used.

J.4.2 Take the result as the arithmetic mean of duplicate determinations.

Annex K
(normative)

Determination of volatile matter

K.1 Principle

A known mass of composite sample is oven-dried to constant mass.

K.2 Apparatus

K.2.1 **Porcelain or silica dish**, 6 cm to 8 cm diameter and 2 cm to 4 cm depth

K.2.2 **Desiccator**, containing an efficient desiccant

K.2.3 **Air-Oven**, electrically heated

K.2 Procedure

Weigh to the nearest 0.001 g, 5 g of the sample in a tarred dish, which has been previously dried and cooled. Heat the dish and its content in an oven at 105 ºC ± 2 ºC for an hour. Cool in a desiccator and weigh. Repeat the operation of heating, cooling and weighing until the difference in mass between two successive weighings are less than 0.01 g. Carry out this determination in duplicate and take the mean of the results.

K.3 Calculation

The volatile matter content, expressed as percent by mass, shall be calculated as follows:

$$\frac{m_1 - m_2}{m_0} \times 100$$

where

m_0 is the mass, in grams, of sample used;

m_1 is the mass, in grams, of sample and dish before heating;

m_2 is the mass, in grams, of sample and dish after heating.

Bibliography

KS 809 Specification for toilet cleansers Part 1: Powder toilet bowl cleanser

IS 13760:2024, Toilet cleaner powder - specification