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Acidic liquid toilet cleaners — Specification

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Table of contents

1 Scope 1
2 Normative references 1
3 Definitions and abbreviations 1
4 Requirements 1
4.1 General requirements 1
4.2 Specific quality requirements 1
5 Packaging and marking 2
5.1 Packaging 2
5.2 Marking 2
Annex A (normative) Determination of acidity 4
Annex B (normative) Determination of non-ionic, anionic and cationic surfactant content 5
Annex C (normative) Method for assessing corrosion potential 6
Bibliography 8

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Acidic liquid toilet cleaners — Specification

1 Scope

This African Standard specifies requirements and methods of test for acidic liquid toilet cleaners. This standard applies to a liquid acid, heavy-duty compound suitable for cleaning toilet bowls and urinals.

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.

<Text>

3 Definitions and abbreviations

For the purpose of this standard the following definitions apply.

toilet cleaner
product used for cleaning of toilet bowls and urinals

4 Requirements

4.1 General requirements

4.1.1 The product shall be a homogeneous aqueous liquid.

4.1.2 The product shall be miscible in water in all proportions.

4.1.3 The product shall be stable, and not deteriorate in storage when kept in its original unopened container at ambient temperature for a period stipulated by the manufacturer as the best before date.

4.1.4 The product shall not affect toilet bowl and urinal surfaces when used as directed by the manufacturer.

4.2 Specific requirements

4.2.1 The product shall comply with the specific requirements prescribed in Table 1.

Table 1 — Specific quality requirements for acid toilet cleaner

S/ No	Characteristic	Requirement		Test method
		Min.	Max.	
(i)	Total acidity (expressed as HCl), %, m/m	7	12	Annex A
(ii)	Total surfactant, %, m/m	0.4	5	Annex B

4.2.2 The product shall contain an effective rust inhibitor when tested in accordance with Annex C.

5 Packaging and labelling

5.1 Packaging

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

5.1.2 The lid or cap on the container shall be such that the product is easily and safely dispensed from the container.

5.2 Labelling

5.2.1 All information marked on the containers shall be marked in a manner that is conspicuous, legible and indelible.

5.2.2 Each container shall be marked with the following information:

a) Type of the product as “acidic toilet cleaner”

b) manufacturer’s name and physical address

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

c) batch or code number;

d) net contents;

e) instruction of use;

f) date of manufacture and expiry date; and

g) country of origin (manufacturer’s name, physical address, and trade mark (if any) and name and physical address of the distributor/supplier if any);

h) precautionary notice:

i) the word 'CAUTION' shall be in a colour that contrasts with the surrounding for easy visibility and shall be followed with the statement, ‘READ LABEL BEFORE USE';

ii) the following shall be marked immediately under i):

- 'Keep Out of Reach of Children';
- contains acid, the hazards involved and the necessary storage precautions to be used;
- that, in case of floor spills, baking soda ash shall be sprinkled over the product and the affected area shall be rinsed with water;
- the product shall be used for the cleaning of toilet bowls and urinals only;
- the product shall be marked with the following cautionary words and symbols:
  - ‘CORROSIVE ACID’; followed by the symbol,

- ‘DANGER’ ;

Annex A
(normative)

Determination of acidity

Accurately weigh 10 g of sample in a 250-mL Erlenmeyer flask and add 25 mL of distilled water. Add approximately 15 mL of 5 % aqueous calcium acetate solution and warm contents to 50 °C. Cool and filter into beaker.

Carefully rinse the Erlenmeyer flask precipitate with 3 to 4 aliquots of distilled water collecting all rinsing with the filtrate. Titrate the filtrate with standard 1 mol/L NaOH solution.

Calculate as follows:

$$\text{percent acidity} = \frac{\text{concentration of NaOH (mol/L) x mL of NaOH x } C}{\text{mass of sample}}$$

where

C = 3.647 for HCl or

C = 3.132 for H_3PO_4

Annex B
(normative)

Determination of non-ionic, anionic and cationic surfactant content

B.1 The molar mass and chemical name of all surfactants used shall be supplied by the manufacturer on request by respective partner states bureaux of standards, when use of High Pressure Liquid Chromatography (HPLC) equipment is employed in the determination of surfactant content in the product.

B.2 Accurately weigh about 100 g of the product in a 250-mL Erlenmeyer flask and neutralize it with caustic soda solution to a pH of 8.8 to 7.0.

B.3 Evaporate the resulting solution to dryness at 105 °C. Cool to room temperature and wash the resulting solids with five 20 mL aliquots of chloroform, filtering and collecting each in one tared 300-mL beaker. Evaporate the chloroform and determine the weight of organic solids, (W_1) g.

$$W_1\left(\text{Organic solids}\right)=\frac{\text{mass of solids}}{\text{mass of product}}$$

NOTE Myer's reagent may be used to confirm nonionic surfactant. Dissolve 100 mg to 150 mg of isolated surfactants in 5 mL of distilled water. Add two drops of Myer's reagent. A yellow precipitate will form if non-ionic surfactant is present.

B.4 Dissolve the organic solids in 50 mL of ethanol and pass resulting solution through a 22 mm x 200 mm x 250 mm chromatographic column of freshly regenerated cationic exchange resin (150 mm to 175 mm mesh). Wash the beaker with four 50 mL aliquots of ethanol collecting them in one tared beaker. (Cationic surfactant, if present, will be retained, the eluate will contain nonionic and anionic surfactants, if present). Evaporate the alcohol eluate in an oven. Weigh accurately, (W_2).

cationic surfactant, g = $W_1 - W_2$

B.5 Dissolve organic solids (W_2), g obtained in B.4 in 50 mL of ethanol and pass the resulting solution through a chromatographic column specified in B.4 but having freshly regenerated anionic exchange resin (150 mm to 175 mm mesh). Wash the beaker with four 50 mL aliquots of alcohol collecting them in one tared beaker. (Anionic surfactant, if present, will be retained, the eluate will contain only nonionic surfactant). Weigh accurately, W_3, g.

B.6 By difference,

anionic surfactant content, g = ($W_2 - W_3$)

surfactant content, percent m/m = $\frac{\left(W_1-W_2\right)+W_3}{m}\times 100$ or

$$= \frac{W_2}{\text{m}} \text{ x } 100 \text{ \%(anionic cleanser)}$$

Annex C
(normative)

Method for assessing corrosion potential

C.1 Apparatus

C.1.1 Squat and tall 1-L Pyrex glass beakers

C.1.2 Oven, capable of maintaining 105 °C ± 2 °C

C.1.3 Test panel, made of stainless steel, of approximate dimensions 125 mm x 63 mm x 1.5 mm. The panels shall have a cold-rolled finish on both faces. They shall be undamaged and unmarked, flat and with their edges free from burrs.

C.1.4 Stainless steel tongs, for handling the panels

C.1.5 Panel bolders, made of inert material such as polypropylene for use during pre-cleaning and drying operations

C.1.6 Rubber bands, of rectangular cross-section, measuring when lying flat and unstretched, approximately 80 mm x 6 mm

C.1.7 Magnesium carbonate (technical), for use as an abrasive in cleaning panels

C.1.8 Distilled water

C.1.9 Watch glass, large enough to cover the tall 1-L beakers in C1.1

C.2 Pre-cleaning of test panels and rubber bands

C.2.1 Panels

C.2.1.1 Swab the test panels, two for each test, with cotton wool using a warm 1 % v/v solution of a general purpose detergent.

C.2.1.2 Scour the panels with cotton wool using water as a lubricant and the magnesium carbonate as an abrasive.

NOTE Scouring also removes any films produced by reaction between the detergent and the abrasive, for example, magnesium silicate.

C.2.1.3 Without delay, thoroughly rinse the panels under hot tap water, ensuring that all of the magnesium carbonate is removed.

C.2.1.4 Then, rinse the panels in boiling, distilled water immersing each panel in turn in water contained in three 1-L beakers.

C.2.1.5 Dry in an oven at 105 °C ± 2 °C.

C.2.1.6 Allow to cool in a dry, dust-free position.

C.2.2 Rubber bands

C.2.2.1 Place the rubber bands in a hard-boiling 1 % v/v solution of a general cleaning detergent for 10 min.

C.2.2.2 Rinse under hot tap water.

C.2.2.3 Then rinse in distilled water and allow to dry.

C.3 Procedure

C.3.1 The procedure shall be carried out in duplicate in accordance with C.3.2 – C.3.9.

C.3.2 In a tall 1-L beaker, make up 950 mL of the use dilution of the product under test. Mark the level of the solution on the side of the beaker.

C.3.3 Place two rubber bands around each test panel in the direction of the long axis of the panel, ensuring that the bands are flat against both sides of the panel and that the panel is not touched by the fingers.

C.3.4 Five minutes after placement of the bands, immerse the panels on their ends as upright as possible in the test solution, so that there is at least 10 mm of solution above the panels. Note the time. Place the watch glasses on the beaker.

C.3.5 Leave the panels in the test solution for 72 h. Each morning and evening, top up the solution to the mark with distilled water.

C.3.6 At the end of the 72 h remove the panels from the test solution, remove the bands and rinse the panels under hot, running water.

C.3.7 Then rinse three times as prescribed in C.2.1.4**.**

C.3.8 Finally, dry the panels in the oven at 105 °C ± 2 °C.

C.3.9 Examine the panels for:

a. evidence of corrosion, and

b. discolouration.

NOTE Pitting is most likely to occur where the rubber band contacts the edges of the panel.

C.4 Interpretation of results

If the duplicate panels from the test detergents show the same characteristics, record the results. If the duplicates differ, repeat the test using fresh panels.

C.5 Report

The product shall be deemed to contain an effective rust inhibitor if no visible corrosion or discolouration of the panels has occurred.

Bibliography

Working Group to identify and acknowledge useful literature used in the preparation of this standard.

KS EAS 793-1:2013, *Kenya Standard — Toilet cleansers — Part 1: Acidic liquid toilet cleansers — Specification*