

DKS 2119: 2013

KENYA STANDARD

Heavy-duty alkaline detergents for 'Cleaning-in-place' in food and beverage industry – Specification

© KEBS 2013 — All rights reserved

First Edition 2013

JULY 2013

PUBLIC REVIEW DRAFT

DKS 2119:2013

TECHNICAL COMMITTEE REPRESENTATION

The following organizations were represented on the Technical Committee:

PZ Cussons E.A.
Haco Tiger Brands
Unilever Kenya Ltd.
Kenya Industrial Research and Development Institute (KIRDI)
Government Chemist's Department
Orbit Chemicals
Brookside Dairy Ltd.
Odex Chemicals Ltd
Johnson Diversey E & C Africa
University of Nairobi
Rumorth Group
Ecolab Limited
MEP Chemical Industries
Consumer Information Network
Kenya Bureau of Standards — Secretariat

REVISION OF KENYA STANDARDS

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

© Kenya Bureau of Standards, 2013

Copyright. Users are reminded that by virtue of section 6 of the Copyright Act, Cap. 130 of the Laws of Kenya, copyright subsists in all Kenya Standards and except as provided under section 7 of this Act, no Kenya Standard produced by Kenya Bureau of Standards may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from the Managing Director.

Permission may be conditional on an appropriate royalty payment.

Care should be taken to ensure that material used is from the current edition of the standard and that it is updated whenever the standard is amended or revised. The number and date of the standard should therefore be clearly identified.

The use of material in print or in electronic form to be used commercially with or without payment or in commercial contracts is subject to payment of a royalty.

DRAFT KENYA STANDARD

Heavy-duty alkaline detergents for 'Cleaning in-place' in food and beverage industry – Specification

KENYA BUREAU OF STANDARDS (KEBS)

Head Office: P.O. Box 54974, Nairobi-00200, Tel.: (+254 020) 605490, 602350, Fax: (+254 020) 604031
E-Mail: info@kebs.org, Web: <http://www.kebs.org>

Coast Region	Lake Region	Rift Valley Region
P.O. Box 99876, Mombasa-80100	P.O. Box 2949, Kisumu-40100	P.O. Box 2138,
Nakuru-20100		
Tel.: (+254 041) 229563, 230939/40	Tel.: (+254 057) 23549, 22396	Tel.: (+254 051) 210553,
210555		
Fax: (+254 041) 229448	Fax: (+254 057) 21814	

DKS 2119: 2013

Foreword

This Kenya Standard was developed by the Technical Committee on Surface Active Agents under the guidance of the Standards Projects Committee and it is in accordance with the procedures of the Bureau.

This standard is one of the standards dealing with food and beverage industry detergents and sanitizers. The standard specifies the requirements for heavy duty alkaline detergents. The detergents are used to clean alkaline resistant flexible connections in the food and beverage industry.

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

AS NZS 1400:1997 Heavy-duty alkaline detergents for 'in-place' cleaning in dairy factories

Acknowledgement is hereby made for assistance derived from this source.

PUBLIC REVIEW DRAFT

Heavy-duty alkaline detergents for 'Cleaning-in-place' in food and beverage industry

1 Scope

This standard specifies requirements for heavy-duty alkaline detergents designed primarily for the removal of 'difficult'/stubborn soils from stainless steel equipment in food and beverage industry.

The type of detergent specified is suitable for the cleaning of alkali-resistant flexible connections.

2 Normative references

This Kenya Standard incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate place in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this Kenya Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

KS ISO 4316: *Surface active agents - Determination of pH of aqueous solution - Potentiometric method*

KS ISO 684: *Analysis of soaps - Determination of total free alkali*

KS 92 part 3: *Synthetic detergent powders — Specification, Part 3: Determination of biodegradability of surfactants — Test method*

KS 1290 Part 1: *Specification for bleaching agents, Part 1. Sodium hypochlorite solutions*

3 Definitions

For the purpose of this standard the definitions below shall apply.

3.1 Soil — any residue and other deposits to be removed from the food and beverage-contact surface during the cleaning process.

3.2 Use dilution — the concentration of detergent in water that the manufacturer has recommended for use in a specific application

3.3 Use temperature — the temperature that the supplier/manufacturer has recommended for a specific application. Cold is between 1 °C and 35 °C, warm between 36 °C and 59 °C, and hot is 60 °C and above.

3.4 Cleaning-in-place (CIP) — a method for cleaning equipment, using no direct mechanical aid to remove the soil but depending on solution flows, temperature and the properties of the detergent solution.

4 Requirements

4.1 General

4.1.1 The product shall be either liquid or powder.

DKS 2119:2013

4.1.2 Powdered product shall be homogenously blended and free flowing. Any caking that occurs during normal storage in sealed containers shall be easily broken up so that the material again becomes free flowing.

4.1.3 The product shall not contain any perfume or fragrant deodorizer

4.1.4 Any dyes used shall be approved food colouring substances

4.1.5 When used in accordance with the manufacturer's/supplier's instructions the product shall not taint, or impart any flavour to, food and beverage products

4.1.6 The product shall be free from foreign matter

4.1.7 When used in accordance with the manufacturer's/supplier's instructions the product shall not cause any residues harmful to humans or to the quality of food and beverage products.

4.1.8 The raw materials used in the manufacture of the product shall be biodegradable when tested against KS 92 part 3.

4.2 Specific quality requirements

The product shall comply with the specific quality requirements in Table 1, Table 2 Table 3 or Table 4

Table 1: Specific quality requirements for alkaline liquid detergents without chlorine

Sl. No.	Property	Requirement	Test Method
1)	Alkalinity (as NaOH), % (m/m), minimum	12	KS ISO 684
2)	Appearance	Colourless, clear liquid to light brown	Visual
3)	pH, 1% solution, minimum	12.0	KS ISO 4316

Table 2: Specific quality requirements for alkaline liquid detergents with chlorine

Sl. No.	Property	Requirement	Test Method
1)	Alkalinity (as NaOH), % (m/m), minimum	40	KS ISO 684
2)	Appearance	Colourless, clear liquid to light brown	Visual
3)	pH, 1% solution, minimum	11.0	KS ISO 4316

Table 3: Specific quality requirements for alkaline powder detergents without chlorine

Sl. No.	Property	Requirement	Test Method
1)	Appearance	Off white, free flowing granular powder	Visual
2)	Alkalinity (as NaOH/Na ₂ O), % (m/m), minimum	Active 65 as Na ₂ O or 83 as NaOH	KS 1290 Part 1
3)	pH, 1% solution, minimum	12	KS 1290 Part 1

Table 4: Specific quality requirements for powder detergents with chlorine

Sl. No.	Property	Requirement	Test Method
1)	Appearance	Off white, free flowing granular powder	Visual
2)	Alkalinity (as NaOH/Na ₂ O), % (m/m), minimum	10 as Na ₂ O 12 as NaOH	KS 1290 Part 1
3)	pH, 1% solution, range	8 - 13	KS 1290 part 1
4)	Available chlorine, percent, minimum	2	KS 1290 Part 1

5. Solubility in water

The solubility of the product in water shall be such that at a concentration three times the use dilution in water, at the minimum temperature recommended by the manufacturer, it will reasonably dissolve. Any residue shall be completely rinse-able and free from grit.

6. Degree of foaming

When determined in accordance with Annex A, the degree of foaming of the product at the use dilution at the minimum recommended temperature of use shall be categorized in accordance with the measured volume of foam recorded in the test, as shown in Table 5.

**Table 5
Categorization of foaming**

Degree of foaming	Measured volume of foam mL	Maximum acceptable difference between the results mL
Low foam	Less than 30	5
Medium foam	30 to 100	10
High foam	Above 100	20

7. Sequestering ability

The sequestering ability of the product shall be such that, at the minimum temperature and at the use dilution recommended by the manufacturer, it is demonstrably suitable for use with water of hardness up to 200 mg/L expressed as calcium carbonate.

8. Corrosion potential

When determined in accordance with Annex B, the corrosion potential of the detergent, at the use dilution at the maximum use temperature recommended by the manufacturer, shall be such that there is no visible evidence of corrosion or discolouration on the test panels.

9. Packaging

The product shall be so packed as to prevent excessive drying out, leakage, or its contamination.

The product shall be packed in containers that are strong enough to withstand normal usage and transportation.

10 Marking

10.1 Each package shall be legibly and indelibly marked with the following information :

- i) product name 'heavy duty alkaline detergent'
- ii) manufacturer's name and physical address;
- iii) NOTE: The name, physical address of the distributor/supplier and trade mark may be added as required
- iv) directions for application, storage and use
- v) precautions
- vi) the 'use by' date
- vii) net contents
- viii) date of manufacture
- ix) batch number
- x) country of origin

10.2 The following information shall be provided to the consumer

- i) Directions for application, storage and use
- ii) List of ingredients
- iii) Degree of foaming
- iv) Precautions

PUBLIC REVIEW DRAFT

Annex A (Normative)

Method for determining degree of foaming

A.1 Scope

This Annex sets out a method for determining the degree of foaming of heavy-duty alkaline detergents for 'in-place' cleaning in dairy factories

A.2 Apparatus

The following apparatus is required:

- a) A 1000 mL one-mark volumetric flask
- b) A stoppered 250 mL measuring cylinder
- c) A thermostatically controlled water bath capable of maintaining the test temperature (see Paragraph B4(c)) within $\pm 1^{\circ}\text{C}$
- d) A stop watch

A.3 Test solution

Prepare 1 L of stock test solution by taking the required representative quantity of the detergent under test and making a solution at the use dilution with water.

A.4 Procedure

The procedure shall be as follows:

- a) Rinse a clean (see Note) 250 mL stoppered measuring cylinder with a suitable volume of test solution. Allow the surplus to drain.
- b) Transfer a 100 mL aliquot of test solution to the 250 mL cylinder with a suitable volume of test solution. Allow the surplus to drain.
- c) Using the water bath, adjust the temperature of the measuring cylinder and its contents to the minimum temperature recommended by the manufacturer of the detergent. The entire length of the cylinder should be immersed in the enclosed water bath.
- d) Stopper the cylinder, and holding it vertical, shake it vigorously 10 times through a throw of approximately 30 cm in the vertical plane, the whole action taking approximately 3 s.
- e) Sixty seconds after the cessation of shaking, determine the volume of foam, recording this to the nearest millilitre
- f) Repeat steps (a) to (e) using another 100 mL aliquot of test solution, and keep repeating until a variation between two results is obtained that conforms to the limit prescribed in Clause 6. Record the mean volume of foam

A.5 Expression of results

The degree of foaming shall be expressed in accordance with Clause 6, i.e. 'low foaming', 'medium foaming' or 'high foaming'.

A.6 Report

The report shall contain the following information:

- a) The degree of foaming, i.e. 'low foaming' 'medium foaming' or 'high foaming'
- b) The concentration of the test solution, i.e. the use dilution
- c) The temperature at which the test was conducted

PUBLIC REVIEW DRAFT

Annex B
(Normative)

Method for assessing corrosion potential

B.1 Scope

This Annex sets out a method for assessing the corrosion potential of heavy-duty alkaline detergents for 'in-place' cleaning in food and beverage industry.

B.2 Apparatus and materials

The following special apparatus and materials required:

- a) Squat and tall 1 L beakers of Pyrex glass and watch glasses and watch glasses to cover beakers
- b) A water-bath with a close-fitting lid capable of maintaining the test temperature (see Clause B4(b)) within $\pm 1^\circ\text{C}$
- c) An oven capable of maintaining a temperature of $105 \pm 2^\circ\text{C}$.
- d) Test panels made of stainless steel (316) of approximate dimensions 125 mm x 63 mm x 1.5 mm. The panels shall have a '2B' finish on both faces. They shall be undamaged and unmarked, flat and with their edges free from burrs.
- e) Stainless steel tongs for handling the panels
- f) Panel holders made of inert material such as polypropylene for use during pre-cleaning and drying operations
- g) Rubber bands of rectangular cross-section, measuring, when lying flat and unstretched, approximately 80 mm x 6 mm
- h) Magnesium carbonate (technical) for use as an abrasive for cleaning the panels
- i) Distilled water
- j) Watch glasses large enough to cover the tall 1 L beakers

B.3 Pre-cleaning of test panels and rubber bands

B.3.1 Panels — The pre-cleaning procedure for panels shall be as follows:

- a) Swab the test panels, two for each test, with cotton wool using a warm 1% m/V solution of a general purpose dairy detergent
- b) 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, e.g. magnesium silicate

- c) Without delay, thoroughly rinse the panels under hot tap water, ensuring that all of the magnesium carbonate is removed
- d) Then, rinse the panels in boiling, distilled water immersing each panel in turn in water contained in three 1 L beakers
- e) Dry in an oven at $105 \pm 2^{\circ}\text{C}$
- f) Allow to cool in a dry, dust-free position

B.3.2 Rubber bands

The pre-cleaning procedure for rubber bands shall be as follows:

- a) Place the rubber bands in a hard-boiling 1% m/V solution of general purpose daily detergent for 10 min
- b) Rinse under hot tap water
- c) Then rinse in distilled water and allow to dry.

B.4 Procedure

The procedure shall be as follows, carried out in duplicate:

- a) In a tall 1 L beaker, make up 950 mL of the use dilution of the detergent under test. Mark the level of the solution on the side of the beaker
- b) Heat the solution to a maximum use temperature recommended by the manufacturer of the detergent. Place the beaker of solution in a water bath controlled at the maximum use temperature $\pm 1^{\circ}\text{C}$
- c) 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
- d) 5 min 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
- e) Leave the panels in the test solution for 72 h. Each morning and evening, top up the solution to the mark with distilled water
- f) At the end of the 72 h, remove the panels from the test solution, remove the rubber bands and rinse the panels under hot, running tap water
- g) Then, rinse three times as prescribed in Paragraph B.3.1 (d)
- h) Finally, dry the panels in the oven at $105 \pm 2^{\circ}\text{C}$. Allow to cool
- i) Examine the panels for -
 - (i) evidence of corrosion; or
 - (ii) discolouration

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

B.5 Interpretation of results

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

B.6 Report — The report shall contain the following information:

- a) Whether visible corrosion or discolouration of the panels has occurred

PUBLIC REVIEW DRAFT