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EAST AFRICAN STANDARD

Synthetic liquid laundry detergent — Specification

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) and other deliverables. 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 and other deliverables 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.

This second edition cancels and replaces EAS 816-1:2015 *Synthetic liquid laundry detergents — Specification - Part 1: Hand wash (first edition)*; and EAS 816-2:2015 *Synthetic liquid laundry detergents — Specification - Part 2: machine wash (first edition)* which have been technically revised.

Introduction

Liquid laundry detergents are becoming popular around the world due to their convenience in dispensing, easy dispersion and dissolution in the wash water. They give a better performance than soaps and detergent powders, especially when used for laundering delicate fabrics like silk, wool and synthetic fabrics.

Liquid laundry detergents are easy to use and easy to store. They come in handy, portable containers that are convenient for people who must carry products to public and domestic laundry facilities. They dissolve easily in all kinds of water and generally remove dirt and grease from clothing very well. Liquid detergents can also be used as spot stain removers.

There are two main groups of detergents, namely, the soaps and synthetic detergents. In order to guide the production of synthetic detergents of well-defined quality and also to safeguard consumer interests, it has been felt desirable to formulate this standard.

Synthetic liquid laundry detergent — Specification

1 Scope

This Draft East African Standard specifies the requirements, sampling and test methods for hand wash and machine wash synthetic liquid laundry detergents.

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.

EAS 217-1-1, *Methods for the microbiological examination of foods — Part 1-1: General procedures and techniques*

EAS 794, *Determination of the microbial inhibition of cosmetic soap bars and liquid hand and body washes — Test method*

EAS 814, *Determination of biodegradability of surfactants — Test method*

ISO 2870, *Surface active agents — Detergents — Determination of anionic-active matter hydrolysable and non-hydrolysable under acid conditions*

ISO 2871-1, *Surface active agents — Detergents — Determination of cationic-active matter content — Part 1: High-molecular-mass cationic-active matter*

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)*

ISO 4316, *Surface active agents — Determination of pH of aqueous solution — Potentiometric method*

3 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>

3.1

detergent

product specially formulated for cleaning through the process of detergency

3.2

active ingredient

organic surface-active material present in the detergent

3.3

builder

material added to the detergent formulation that enhances or maintains the cleaning efficiency of the surfactant, principally by inactivating water hardness either by sequestration, precipitation or ion exchange

3.4

biodegradable

capable of being decomposed by living matter especially by bacteria

3.5

sequestering agent

material that suppresses the hardness of water and improves the effectiveness of surface active agents by removing metal ions or molecules from the water

3.6

defective

unacceptable or unsuitable for distribution or sale as determined by conformity with this standard

3.8

package

unit in which the detergent is stored, which is labelled, and distributed for individual sale

3.9

manufacturer

person or organization actually engaged in or being principally responsible for manufacturing or producing the laundry detergent

3.10

batch

material from a single mix or, in the case of a continuous production process, the material from a single day's production

3.12

lot

quantity of a detergent bearing the same batch identification, from one manufacturer, and submitted at any one time for inspection and testing

4 Requirements

4.1 General requirements

4.1.1 Synthetic liquid laundry detergent shall:

- a) be a stable, uniform solution of synthetic detergents, with sequestering agents and builders and with or without optical brighteners, enzymes and softeners;
- b) be a free-flowing liquid;
- c) not give any objectionable odour and shall have good cleaning properties; and
- d) be completely miscible with water

4.1.2 The active ingredient used shall be biodegradable when tested in accordance with EAS 814.

4.1.4 If synthetic liquid laundry detergent is coloured, the colouring shall be uniform and shall not change appreciably during storage

4.2 Specific requirements

Synthetic liquid laundry detergent shall comply with the specific requirements given in Table 1, when tested in accordance with the method prescribed therein.

Table 1 — Specific requirements for synthetic liquid laundry detergent

S/No	Characteristic	Requirement		Test method
		Hand wash	Machine wash	
i	Total active content, min, % m/m	10	8	ISO 2870 ISO 2871-1 ISO 2871-2
ii	pH, 1 % solution at 25 °C ± 2 °C	5 – 11	5 – 11	ISO 4316
iii	Total viable count, cfu/g (max)	200	200	EAS 217-1-1
iv	Foam test, 1 % solution ml, max. Initial height Height after 5 min.	N/A	100 30	Annex A
v	Rinsing properties	To pass the test		Annex B
vi	Antibacterial activity ^{a)}	To pass the test		EAS 794.

^{a)}Only for synthetic liquid laundry detergents containing antibacterial agents claims.

N/A – Not applicable

5 Packaging

The product shall be packaged in containers that are able to withstand normal usage, storage and transportation and that will prevent leaking, drying out and contamination of the product.

6 Labelling

Each container and each bulk package shall be in prominent, legibly and indelibly labelled either in English, Kiswahili or French or combination or any other language as agreed between the manufacturer and supplier with the following information:

- name of the product as “Synthetic liquid laundry detergent”
- indication of whether it is hand wash or machine wash;
- manufacturer’s name and physical address;

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

- batch or lot number;

- e) list of ingredients
- f) net content;
- g) declare antibacterial agents if used;
- h) instructions for use;
- i) date of manufacture and best before date;
- j) country of origin; and
- k) indicate mode of disposal of containers/packages.

7 Sampling

Sampling shall be done in accordance with Annex C.

Annex A (normative)

Determination of foam

A.1 Foaming

Foaming capacity of detergents is an important property. In some instance, a high foam is required and in others no foam at all or a very low foam is desirable. It is necessary to standardize the following factors:

- a) concentration of active water;
- b) type of water to be used;
- c) temperature of solution; and
- d) period of aging.

A.2 Apparatus

A.2.1 500-ml glass measuring cylinder

A.2.2 250-ml glass separating funnel

A.2.3 50-ml glass pipette

A.2.4 250-ml glass cylinder

A.2.5 Analytical balance

A.3 Preparation of standard hard water (50 ppm as calcium carbonate)

A.3.1 Reagents

A.3.1.1 Analar calcium chloride dihydrate, $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$

A.3.1.2 Analar magnesium sulphate heptahydrate, $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$

A.3.1.3 Deionized water

A.3.2 Method

Dissolve 0.0440 g Analar calcium chloride dihydrate and 0.0492 g Analar magnesium sulphate heptahydrate in deionized water. Make up volume to 1 L with deionized water.

A.3.3 Preparation of test solution

Prepare a solution containing 6 g of the detergent per litre in standard hard water.

Warm the solution to the temperature of 60 °C and allow to 'age' at this temperature for 10 min.

A.4 Procedure

A.4.1 Draw 50 ml of the solution into a 50-ml pipette.

A.4.2 Hold the pipette against the upper inside portion of the 500-ml glass measuring cylinder and allow the solution to run into the cylinder, moving the pipette so that it revolves around the complete circumference of the cylinder so that the solution wets the walls of the cylinder. The solution remains in the cylinder.

A.4.3 Into the 250-ml glass cylinder, pour in 200 ml of the solution and pour this into the separating funnel. Clamp into position the separating funnel so that its spout points to the centre of the 500-ml cylinder and is level with the rim of the 500-ml measuring cylinder (see Figure A.1). The positioning is such that the stream of liquid will impinge only on the surface of the liquid.

A.4.4 Open the stopcock fully to allow the solution to fall onto the liquid

The moment the flow ceases, read the volume of the foam (V_1).

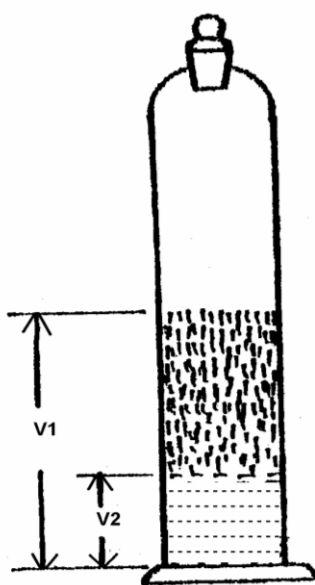


Figure A.1 — Measurement of foam

After 5 min read the foam volume again (V_2).

- foaming power = $V_1 - 250$ ml (the amount of liquid in cylinder); and
- foaming stability = $V_2 - 250$ ml;

For example, foaming power = $350 - 250$

$$= 100$$

For comparison of efficacy in hard and soft water, the whole method can be repeated using deionized water instead of the standard hard water.

Annex B (normative)

Determination of rinsing properties

Make a solution of the material at the recommended dilution, following the manufacturer's directions, in enough synthetic hard water (300 ppm hardness), to give 100 ml of total solution. Pour the resultant solution into a clean, dry 250-ml Erlenmeyer flask. Stopper the flask and shake vigorously for 1 min. Pour out the solution and rinse the flask three times with 75-ml portions of synthetic hard water alone. Invert the flask and allow to dry. Examine for any residue. The flask shall contain no more residue than a flask allowed to dry after rinsing with synthetic hard water alone.

NOTE Synthetic hard water contains:

- 0.246 g/L of $\text{CaCl}_2 \cdot 2\text{H}_2\text{O}$; and
- 0.295 g/L of $\text{MgSO}_4 \cdot 7\text{H}_2\text{O}$.

Annex C (normative)

Sampling procedure for liquid laundry detergents

C.1 Requirements

C.1.1 In drawing, preparing, storing and handling samples, the precautions in C.1.2 – C.1.7 shall be observed.

C.1.2 Samples shall not be taken from places exposed to damp air, dust or soot.

C.1.3 The sampling instruments shall be clean and dry when used.

C.1.4 The samples, the material being sampled, the sampling instruments and the containers for samples shall be protected from adventitious contamination.

C.1.5 The samples shall be placed in clean and dry glass containers. The sample containers shall be of such a size that they are almost completely filled by the sample.

C.1.6 Each container shall be sealed airtight after filling, and marked with full details of sampling which include, date of sampling, batch or lot number, name of manufacturer, and other important particulars of the consignment.

C.1.7 The samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature, and that they are protected from light.

C.2 Scale of sampling

C.2.1 In a single consignment, all the packages containing products of the same type and form, and drawn from the same batch of manufacture, shall constitute a lot. If the consignment consists of packages containing products of different types and forms, then the packages containing products of the same type, form and batch of manufacture shall be grouped together, and such group shall constitute a separate lot.

C.2.2 For ascertaining the conformity of the lot to the requirements prescribed in this standard, tests shall be carried out on each lot separately. The number (n) of packages to be selected for drawing the samples shall depend upon the size (N) of the lot and shall be in accordance with Table C.1.

Table C.1 — Scale of sampling

No. of packages in the lot (N)	No. of packages to be selected (n)
4 – 15	3
16 – 40	4
41 – 65	5
66 – 110	7
111 and above	10
NOTE When the size of the lot is three packages or less, the number of containers to be selected and the criteria for judging the conformity of the lot to the specifications should be as agreed on between the purchaser/inspector and the supplier.	

C.2.3 The packages shall be selected at random and to ensure randomness of selection, a random number table shall be used. In case such tables are not available, the procedure given below may be adopted.

Starting from any package, count all the packages in one order as 1, 2, 3,..., up to r and so on, where r is the integral part of N/n , (N being the lot size and n the number of packages to be selected). Every r^{th} package thus counted shall be withdrawn to give a sample for the purposes of test.

C.3 Preparation of gross samples, test sample and reference sample

C.3.1 Gross sample

From each one of the packages selected as in C.2, draw at random one or more containers. The material in the containers so chosen shall be nearly thrice the quantity required for purpose of test as indicated in C.4.

C.3.2 Test sample

C.3.2.1 From the gross representing each form of synthetic detergent take a small but equal quantity of material and mix thoroughly into a composite sample which should be of a size sufficient to carry out triplicate testing for all the characteristics specified under C.4. The composite samples representing each form and type of the product shall be divided into three equal parts, one for the purchaser/inspector, another for the supplier, and the third for the referee.

C.3.2.2 The remaining portion of the material in each of the gross samples shall be divided into three equal pans, each forming an individual sample. One set of individual samples, representing the n selected packages shall be for the purchaser/inspector, another for the supplier, and the third for reference.

C.3.2.3 All the composite and individual samples shall be transferred to separate containers. These containers shall then be sealed airtight with stoppers, and labelled with full particulars of identification given in B.1.6.

C.3.3 Reference samples

C.3.3.1 The reference samples shall consist of a composite sample and a set of individual samples. All the containers shall bear the seals of both the purchaser/inspector and the supplier, and shall be kept at a place agreed to between the two parties.

C.3.3.2 Reference samples shall be used in case of any dispute between the purchaser/inspector and the supplier.

C.4 Number of tests

C.4.1 Tests for the determination of active ingredient shall be performed on each of the individual samples.

C.4.2 Tests for the determination of other requirements specified in Table 1 shall be conducted on the composite sample.

C.5 Criteria for conformity

C.5.1 For individual samples

C.5.1.1 For the characteristic, which has been determined on the individual sample, the mean (\bar{X}) and the range (R) of test results shall be calculated as follows:

$$\text{Mean}(\bar{X}) = \frac{\text{Sum of test results}}{\text{Number of test results}}$$

Range (R) is the difference between the maximum and the minimum value of test results.

C.5.1.2 If the specification limit for the characteristic is given as a minimum, the value of the expression ($\bar{X} - KR$) shall be calculated from the relevant test results (see C.5.1.5). If the value so obtained is greater than or equal to the minimum limit, the lot shall be declared as conforming to the requirement for the characteristic.

C.5.1.3 If the specification limit for the characteristic is given as a maximum, the value of the expression ($\bar{X} + KR$) shall be calculated from the relevant test results (see C.5.1.5). If the value so obtained is less than or equal to the maximum limit, the lot shall be declared as conforming to the requirement for the characteristic.

C.5.1.4 If the characteristic has two-sided specification limits, then the values of the expression ($\bar{X} \pm KR$) shall be calculated from the relevant test results (see C.5.1.5). If the value so obtained lies between the two specification limits, the lot shall be declared as conforming to the requirement for the characteristic.

B.5.1.5 The value of the factor K referred to in C.5.1.2 - C.5.1.4 shall be chosen in accordance with Table C.2, depending upon the acceptable quality level, that is, the percentage, of non-conforming packages that may be tolerated reasonably.

Table C.2 — Value of 'K' for achieving different acceptable quality levels

Acceptable quality level	Value of 'K'
Not more than 3.0 % defectives	0.4
Not more than 1.5 % defectives	0.5
Not more than 0.5 % defectives	0.6

C.5.2 For composite sample

For declaring the conformity of the lot to the requirements of all the remaining characteristics determined on the composite sample, the test results for each one of the characteristics shall satisfy the relevant requirement given in Table 1 of this standard.

Bibliography

EAS 816 -1:2013 *Synthetic liquid laundry detergents -Specification - Part 1: Hand wash*

EAS 816 -2:2013 *Synthetic liquid laundry detergents -Specification - Part 2: machine wash*

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