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## **DRAFT EAST AFRICAN STANDARD**

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**Chemical hair relaxers and hair waving products — 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). 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 071, *Cosmetics and related products*.

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 third edition cancels and replaces the second edition (EAS 338:2013), which has been technically revised.

# Chemical hair relaxers and hair waving products — Specification

## 1 Scope

This Draft East African Standard specifies the requirements, sampling and methods of test for chemical hair relaxers and hair waving products.

This standard applies to chemical hair relaxers based on alkalis or thioglycollates, as well as hair waving (curling) products based on thioglycollates.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 346, *Labelling of cosmetics — General requirements*

EAS 377 (all parts), *Cosmetics and cosmetic products*

EAS 847-16, *Cosmetics — Analytical methods — Part 16: Determination of lead, mercury and arsenic content*

EAS 847-17, *Cosmetics — Analytical methods — Part 17: Determination of pH*

EAS 847-18, *Cosmetics — Analytical methods — Part 18: Determination of thermal stability*

ISO 18416, *Cosmetics — Microbiology — Detection of *Candida albicans**

ISO 21149, *Cosmetics -- Microbiology -- Enumeration and detection of aerobic mesophilic bacteria*

ISO 22716, *Cosmetics — Good Manufacturing Practices (GMP) — Guidelines on Good Manufacturing Practices*

ISO 22717, *Cosmetics — Microbiology — Detection of *Pseudomonas aeruginosa**

ISO 22718, *Cosmetics — Microbiology — Detection of *Staphylococcus aureus**

ISO 24153, *Random sampling and randomization procedures*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EAS 846 and the following 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**  
**lye based**  
chemical hair relaxers that contain sodium hydroxide
- 3.2**  
**no lye**  
chemical hair relaxers that contain alkalis other than sodium hydroxide such as potassium hydroxide, lithium hydroxide, calcium hydroxide
- 3.3**  
**thioglycolate based**  
relaxer containing ammonium thioglycolate”

## **4 Types**

Chemical hair relaxers and waving products shall be grouped into three categories, namely:

- a) lye-based;
- b) no lye; and
- c) thioglycollate-based

## **5 Requirements**

### **5.1 General requirements**

- 5.1.1** Chemical hair relaxers and waving products shall comply with the requirements specified in all parts of EAS 377.
- 5.1.2** The products shall be in the form of emulsions or gels.
- 5.1.3** These products shall be homogenous and of uniform colour, with no visible signs of separation nor visible impurities.
- 5.1.4** The product shall be manufactured in accordance with the requirements of ISO 22716.

### **5.2 Specific requirements**

- 5.2.1** The lye and no lye relaxers (Type 1 and Type 2) shall, in addition, comply with the requirements given in Table 1 when tested in accordance with the methods indicated therein.

**Table 1 — Specific requirements for lye and no lye chemical hair relaxers**

S.No.	Characteristic	Requirements	Method of test
i	pH range	9- 14	EAS 847-17
ii	Thermal stability	To pass the test	EAS 847-18
iii	Free alkali content, % by mass, max	2.5	Annex A
iv	Total alkali content: % by mass, max	Potassium hydroxide (KOH) - 2.5	Annex B
		Sodium hydroxide (NaOH) -2.5	
		Lithium hydroxide (LiOH) -2.5	
		Calcium hydroxide Ca(OH) <sub>2</sub> -7.0	
		Ammonium hydroxide (NH <sub>4</sub> OH) -6.0	

**5.2.2** The thioglycollate based hair relaxers and hair waving products shall, in addition, comply with the requirements given in Table 2 when tested in accordance with the methods indicated therein.

**Table 2 — Specific requirements for thioglycollate based hair relaxers and hair waving products**

S.No.	Characteristic		Requirements		Method of test
			Thioglycollic acid and its salts	Thioglycollic acid esters	
i	pH range		7- 9.5	6-9.5	EAS 847-17
ii	Thioglycollic acid, %, max	General use	8	8	Annex C
		Professional use	11	11	

### 5.3 Heavy metal contaminants

The products shall comply with the limits for heavy metal contaminants in accordance with Table 3.

**Table3 — Heavy metal limits for chemical hair relaxers and hair waving products**

S.No	Characteristic	Limits, mg/kg, max	Method of test
i	Lead	10	EAS 847-16
ii	Arsenic	2	
iii	Mercury	2	
NOTE The total amount of heavy metals as lead, mercury and arsenic, in combination, in the finished product should not exceed 10 Mg/kg.			

### 5.4 Microbiological limits

The hair relaxers and hair waving products shall also comply with the microbiological limits given in Table 4 when tested in accordance with the methods indicated therein.



**Table 4 — Microbiological limits for hair relaxers and hair waving products**

S/No	Micro-organisms	Limits, Cfu/g	Method of test
I	Total viable count for aerobic mesophyllic microorganisms CFU/ml, max.	100	ISO 21149
li	<i>Pseudomonas aeruginosa</i>	Not detected in 1 ml or 1 g of cosmetic product	ISO 22717
lii	<i>Staphylococcus aureus</i>		ISO 22718
lv	<i>Candida albicans</i>		ISO 18416
v	<i>Escherichia coli</i>	Not detected in 1 g of cosmetic product	ISO 21150

## 6 Packaging

The product shall be packaged in suitable well-sealed containers that shall protect the contents and shall not cause any contamination or react with the product.

## 7 Labelling

In addition, to the labelling requirements given in EAS 346, each package shall be legibly and indelibly marked with the following information (an enclosed leaflet may also be used):

- a) category of product as follows:
  - i. mild — for fine textured or processed hair;
  - ii. regular — For medium textured hair;
  - iii. super — For coarse hair;
- b) type of alkali used;
- c) instructions for use including the neutralising shampoo and conditioner which are recommended for use with the product;
- d) precautions/warnings:
  - i. for products containing thioglycollic acid, its salts and its esters, the warnings include:
    - For professional use only;
    - Contains thioglycollate;
    - Follow the instructions;
    - Avoid contact with eyes;
    - In the event of contact with eyes, rinse immediately with plenty of water and seek medical advice;
    - Wear suitable gloves; and
    - Keep out of reach of children.

ii. for lye-based and no lye relaxers, the warnings include:

- for professional use only;
- contains alkali;
- keep out of reach of children;
- follow the instructions;
- wear suitable gloves;
- avoid contact with eyes as the product can cause blindness; and
- in the event of contact with eyes, rinse immediately with plenty of water and seek medical advice.

## **8 Sampling**

Sampling shall be carried in accordance with ISO 24153.

## Annex A (normative)

### Determination of free alkali content

#### A.1 Outline of the method

This method consists of dissolving the sample in alcohol, and titrating against standard acid.

#### A.2 Reagents

**A.2.1 Phenolphthalein indicator solution**, dissolve 1 g of phenolphthalein in 100 mL of 95 % (v/v) rectified spirit.

**A.2.2 Ethyl alcohol**, freshly boiled, and neutral to phenolphthalein, 95 % (v/v)

**A.2.3 Standard hydrochloric acid**, 0.1 N

#### A.3 Procedure

Dissolve 2 g of hair relaxer in 100 mL of ethyl alcohol by warming, if necessary. Cool and add a few drops of phenolphthalein indicator. Titrate with standard hydrochloric acid.

#### A.4 Calculation

The free alkali content shall be calculated as follows:

$$\text{Free alkali, \% by mass} = \frac{VN}{M} \times C$$

where

C is a Constant

C = 2.4 for LiOH

C = 4 for NaOH

C = 5.6 for KOH

C = 3.7 for Ca(OH)<sub>2</sub>

C = 3.5 for NH<sub>4</sub>OH

V is the volume, in millilitres, of standard hydrochloric acid;

N is the normality of standard hydrochloric acid; and

M is the mass, in grams, of the sample

Where mixtures of sodium, lithium and potassium hydroxide are present in the product, the free alkali content shall not exceed 2.5 % by mass when calculated as sodium hydroxide

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## Annex B (normative)

### Determination of total alkali content

#### B.1 Outline of the method

The method consists of refluxing the sample in alcohol, and titrating with standard acid.

#### B.2 Reagents

**B.2.1 Ethanol**, 95 % (v/v) solution, free from carbon dioxide. Reflux this solution for 5 min. Cool to room temperature and neutralize with the ethanolic potassium hydroxide solution per 200 mL of ethanol.

**B.2.2 Hydrochloric acid**, 1 N standard solution

**B.2.3 Ethanolic potassium hydroxide**, 0.1 N ethanolic standard solution

**B.2.4 Phenolphthalein solution**, of 1 g per 100 mL in 95 % (v/v) ethanol

#### B.3 Apparatus

**B.3.1 Conical flask capacity 250 mL**, with a conical ground-glass joint at the bottom

**B.3.2 Reflux condenser**, water cooled, with a conical ground-glass joint at the bottom

**B.3.3 Analytical balance**

#### B.4 Procedure

**B.4.1** Weigh accurately 2 g of the sample into the flask. Add 100 mL of the ethanol solution to the test portion. Fit the flask to the reflux condenser, and gently heat until the sample is completely dissolved.

**B.4.2** Add 3.0 mL of the hydrochloric acid solution and boil gently for 10 min. If after boiling, the pink colour reappears,

**B.4.3** add a further quantity of hydrochloric acid. Titrate, at 70 °C, with the ethanolic potassium hydroxide solution in the presence of phenolphthalein indicator. Carry out two determinations on the same sample.

#### B.5 Calculation

The total alkali content shall be calculated as follows:



where

$C$  is a Constant

$C = 2.4$  for  $\text{LiOH}$

$C = 4$  for  $\text{NaOH}$ ,

$C = 5.6$  for  $\text{KOH}$

$C = 3.7$  for  $\text{Ca}(\text{OH})_2$

$C = 3.5$  for  $\text{NH}_4\text{OH}$

$V_0$  is the volume, in millilitres, of hydrochloric acid used;

$V_1$  is the volume in millilitres of potassium hydroxide used in titration;

$N_0$  is the exact normality of hydrochloric acid;

$N_1$  is the exact normality of the potassium hydroxide solution used; and.

$M$  is the mass, in grams, of the sample.

Where mixtures of sodium, lithium and potassium hydroxide are present in the product, the total alkali content shall not exceed 2.5 % by mass, calculated as sodium hydroxide.

## Annex C (normative)

### Determination of thioglycollic acid

#### C.1 Reagents

C.1.1 Concentrated hydrochloric acid

C.1.2 Standard iodine solution, 0.1 N

#### C.2 Procedure

Accurately weigh about 5 g of the sample in a 250 mL conical flask. Add about 75 mL of water and 15 mL of concentrated hydrochloric acid and heat on a water bath for 10 min. Cool and titrate with iodine solution using starch solution as the indicator.

#### C.3 Calculation

Calculate on the basis that each ml of 0.1 N iodine solution is equivalent to 0.00921 g of thioglycollic acid.

$$\% \text{ of thioglycollic acid, m/m} = \frac{v \times 0.00921}{M} \times 100$$

where

M is the mass, in grams, of sample taken for test; and

V is the volume, in millilitres, of 0.1 N iodine solution used

## Bibliography

EAS 338: 2013, *Chemical hair relaxers and hair waving products — Specification*

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