DRAFT EAST AFRICAN STANDARD

Hair dyes - Part 1 - Liquid oxidation hair dyes, aryl di-amine-based-
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.

In order to achieve this objective, the Community established an East African Standards Committee mandated to develop and issue East African Standards.

The Committee is composed of representatives of the National Standards Bodies in Partner States, together with the representatives from the private sectors and consumer organizations. 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 procedures of the Community.

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.
Hair dyes - Part 1 - Liquid oxidation hair dyes, aryl.di-amine-based - Specification:

1 Scope

This Draft East Africa Standard specifies requirements and methods of sampling and test for liquid oxidation hair dyes which are aryl di-amine based.

This standard only covers permanent liquid hair dyes that are black, and other colours based on aryl di-amines which acts as primary intermediates in the dye.

This standard does not apply to powder hair dyes, vegetable-based hair dyes, and metallic-based hair dyes (temporary).

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 346, Labelling of cosmetics — General requirements

EAS 377-1, Cosmetics and cosmetic products — Part 1: List of substances prohibited in cosmetic products

EAS 377-2, Cosmetics and cosmetic products — Part 2: List of substances which cosmetic products must not contain except subject to the restrictions laid down

EAS 377-3, Cosmetics and cosmetic products — Part 3: List of colorants allowed in cosmetic products

EAS 377-4, Cosmetics and cosmetic products — Part 4: List of preservatives allowed in cosmetic products

EAS 377-5, Cosmetics and cosmetic products — Part 5: Use of UV filters in cosmetic products

DEAS 847-16, Determination of Heavy metal Content

ISO 24153 Random sampling and randomisation procedures

3 Requirements

3.1 General requirements

3.1.1 A liquid oxidation hair dye shall consist of two ingredients supplied in separate containers as follows:

a) The dyes (aryl diamine);

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b) The developer. All ingredients used shall comply with all parts of EAS 377

3.2 The dye shall be dermatologically safe and shall not cause sensitization on the scalp.

3.3 The dye shall have no undesirable effect on the hair.

3.4 Specific requirements

3.4.1 Dye — The active ingredient shall be an aryl amine dispersed in a suitable surface active agent in an alkaline medium. It may also contain other suitable modifiers. The dye shall comply with the requirements given in Table 1, when tested according to the methods given in the appendices.

<table>
<thead>
<tr>
<th>SL No.</th>
<th>CHARACTERISTIC</th>
<th>REQUIREMENT</th>
<th>METHOD OF TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Type 1 (Black)</td>
<td>Type 2 (Other colours)</td>
</tr>
<tr>
<td>(i)</td>
<td>pH at 25±2°C</td>
<td>9.0 to 11.0</td>
<td>9.0 to 11.0</td>
</tr>
<tr>
<td>(ii)</td>
<td>Total active matter (dye content), per cent m/m</td>
<td>2.5 to 4.0</td>
<td>1.0 to 2.9</td>
</tr>
</tbody>
</table>

The products shall comply with the limits for heavy metal contaminants in accordance with Table 2.

<table>
<thead>
<tr>
<th>SL No.</th>
<th>CHARACTERISTIC</th>
<th>REQUIREMENT</th>
<th>METHOD OF TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Type 1 (Black)</td>
<td>Type 2 (Other colours)</td>
</tr>
<tr>
<td>(iii)</td>
<td>Lead, ppm, max.</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>(iv)</td>
<td>Arsenic, ppm, max.</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>(v)</td>
<td>Mercury, ppm, max.</td>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

NOTE The total amount of heavy metals as lead, mercury and arsenic, in combination, in the finished product should not exceed 20 ppm.

3.4.2 The package shall include a developer, which will be a dilute solution of hydrogen peroxide, free from foreign matter and suitably stabilized. Any other oxidizing agent used shall fall within the EEC approved
chemical substances for cosmetics. It shall comply with the requirements given in Table 3 when tested according to the methods prescribed in the appendices.

### TABLE 3. REQUIREMENTS FOR OXIDIZING AGENT (DEVELOPER)

<table>
<thead>
<tr>
<th>SL No.</th>
<th>CHARACTERISTIC</th>
<th>REQUIREMENT</th>
<th>METHOD OF TEST</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i)</td>
<td>pH</td>
<td>3 to 4</td>
<td>Annex A</td>
</tr>
<tr>
<td>(ii)</td>
<td>H$_2$O$_2$ assay, per cent by mass, (m/m),</td>
<td>5 to 6.5</td>
<td>Annex C</td>
</tr>
</tbody>
</table>

### 3.4.3 HAIR DYE READY FOR USE

The Para phenylene diamine (PPD) content in dye ready for use shall be as given in Table 3. The procedure for calculation is given below the table.

Note: The lower limit of dye is prescribed to check the effectiveness of the dye while the upper limit is prescribed to ensure that the concentration of remains within safe limits.

### TABLE 3. REQUIREMENTS FOR HAIR DYE, READY FOR USE

<table>
<thead>
<tr>
<th>SL No.</th>
<th>CHARACTERISTIC</th>
<th>REQUIREMENTS</th>
<th>TEST METHOD</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Aryl amine in the solution after recommended dilution with developer, calculated as free base, %</td>
<td>(Black) 1.25 to 2</td>
<td>(Other colours) 0.5 to 1.0</td>
</tr>
</tbody>
</table>

Note: The dye ready for use is prepared by mixing the dye content and the developer in the proportion recommended by the manufacturer in the leaflet describing instructions for use.

3.4.4 The procedure for calculation of PPD content in solution after recommended dilution with developer is as follows:

$$\text{Aryl di-amine content in diluted dye} = \frac{X}{Y-1}$$

where,

$X = \text{aryl di-amine content in dye}$;

$Y = \text{number of parts of developer mixed with 1 part of dye}$. 

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4 PACKAGING

4.1 The dye and developer shall each be packed separately in suitable well-sealed containers that shall protect the contents from deterioration and shall not cause any contamination or react with the product.

4.2 The two shall be packed together in a suitably labelled pack.

5 LABELLING

5.1 The containers shall be legibly and indelibly marked in English, Kiswahili or French or in combination as agreed between the manufacturer and supplier. The labelling shall comply with the requirements of EAS 346.

In addition to the requirements of EAS 346, each package shall be marked with the following:

a) The title ‘Liquid Oxidation Hair Dye’;

b) The minimum percentage PPD content;

c) Shade of the dye;

The INCI label names (previously CTFA names) shall be used.

NOTE: INCI stands for International Nomenclature Cosmetic Ingredient

CTFA stands for Cosmetic, Toiletry and Fragrance Association

(d) Intended effect in ‘TEMPORARY HAIR DYE’, ‘SEMI-PERMANENT HAIR DYE’, OR ‘PERMANENT HAIR DYE’.

NOTE: This information may be supplied in an enclosed leaflet if the package is too small.

In addition to the above, the following information shall also be given in the leaflet.

a) Procedure for conducting preliminary test for sensitivity (patch test).

b) Instructions for use.

5.2 CAUTIONS/WARNINGS

5.2.1 The following warnings shall be printed on the label, if the package is for general use:

a) can cause an allergic reaction;

b) contains phenylenediamines;

c) do not use to dye eyelashes or eyebrows.

5.2.2 The following warnings shall be printed on the label, if the package is for professional use:

a) for professional use only;

b) Contains phenylenediamines;
c) can cause an allergic reaction;

d) wear suitable gloves.

5.3 PATCH TEST

Each package shall contain an insert in English, Kiswahili or French or in combination as agreed between the manufacturer and supplier for carrying out a preliminary test by the intended user to avoid skin irritation, as follows:

*Para-phenylenediamine containing preparations may cause serious inflammation of the skin in some cases and so a preliminary test should always be carried out to determine whether or not special sensitivity exists. For carrying out the test, cleanse a small area of skin behind the ear or upon the inner surface of the forearm, using either soap and water or alcohol. Apply a small quantity of the hair dye as prepared for use to the area and allow it to dry. After 48 h, wash the area gently with soap and water. If no irritation or inflammation is apparent, it may be assumed that no hypersensitivity to the dye exists. The test should, however, be carried out before each and every application. This preparation should on no account be used for dyeing eyebrows or eyelashes as severe inflammation of the eye or even blindness may result.

6.0 SAMPLING

Random samples of the product shall be drawn for test in accordance with ISO 24153 from the market, factory or elsewhere.
Annex A
(normative)

DETERMINATION OF pH

A.1 APPARATUS
Any pH meter, preferably equipped with a glass electrode.

A.2 PROCEDURE
A.2.1 For the Dye — Take about 10 mL to 20 mL (or any appropriate amount) of the dye and determine its pH at 23 ± 2 °C using the meter.

A.2.2 For the Developer — Similarly, take 10 mL to 20 mL of the oxidizing agent (developer) and determine its pH at 23 ± 2 °C using the meter.

In both cases, use the procedural instructions as given for the type of pH meter used.
Annex B
(normative)

DETERMINATION OF ARYL AMINE CONTENT AS THE ACTIVE DYE

B.1 OUTLINE OF THE METHOD
This method estimates aryl amine as diacetyl derivative of aryl amine.

B.2 APPARATUS

B2.1 Continuous extraction apparatus as illustrated in Figure B1.

![Continuous Extraction Apparatus Diagram]

All dimensions in millimetres.

FIG. B1 CONTINUOUS EXTRACTION APPARATUS

B.2.2 G 4 sintered glass crucible.
B.2.3 Beaker — 100-mL capacity.

B.3 REAGENTS

B.3.1 Chloroform — Laboratory reagent grade.
B.3.2 Acetic Anhydride — Analytical reagent grade.
B.4 PROCEDURE

Transfer accurately weighed quantity (about 5 g) of liquid hair dye, so as to contain 0.1 g to 0.3 g para-phenylenediamine, to the inner tube of the continuous extractor, previously charged with chloroform. Take 60 mL chloroform in the flask and completely extract the dye. About 5 h extraction is sufficient. Remove the flask and transfer chloroform extract to 100-mL beaker, rinsing the flask with few small portions of chloroform.

Evaporate chloroform to about 25 mL and add 1 mL acetic anhydride slowly, with stirring. Let it stand for one hour and filter on a weighed G 4 sintered glass crucible. Wash the beaker and precipitate with three or four 5-mL portions of chloroform. Carefully, remove last traces of precipitate from the beaker. Dry to constant mass at 120°C and weigh the precipitate of diacetyl para-phenylenediamine C₆H₄(NH₂COCH₃)₂.

B.5 CALCULATION

Aryl amine content (as para-phenylenediamine) = \[ \frac{M_1 \times 0.5626 \times 100}{M_2} \]

where,

\( M_1 \) = mass, in g, of the precipitate, and
\( M_2 \) = mass, in g, of the hair dye taken for extraction.
Annex C  
(normative)

Determination of hydrogen peroxide content

C.1 REAGENTS

C.1.1 Dilute Sulphuric Acid

C.1.2 Potassium Permanganate Solution — N/10, freshly standardized.

C.2 PROCEDURE

Take 10 g of the developer and dilute to 500 mL. Take 25 mL of this dilute solution in a conical flask, add 5 mL of sulphuric acid and titrate against potassium permanganate solution.

C.3 CALCULATION

\[ \text{H}_2\text{O}_2 \text{ assay, per cent m/m} = \frac{VN}{M} \times 34.02 \]

where,

- \( V \) = volume of potassium permanganate solution taken for titration;
- \( N \) = normality of potassium permanganate solution; and
- \( M \) = mass of developer taken to prepare 500 mL solution.