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DRAFT EAST AFRICAN STANDARD

Method for determination of added oil content of sisal or jute yarn or fabric

EAST AFRICAN COMMUNITY

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East African Community
P.O. Box 1096,
Arusha
Tanzania
Tel: + 255 27 2162100
Fax: + 255 27 2162190
E-mail: eac@eachq.org
Web: www.eac-quality.net

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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 061, Textiles, textile products and accessories.

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 the first edition (EAS 246:2001), which has been technically revised. The main changes compared to the previous edition are as follows:

- A clause on normative references has been added;

Introduction

Light mineral oil, as an oil-in-water emulsion, is added to sisal or jute fibres during spinning (conversion to yarn), and some or all of this oil is present in the sisal or jute after or at later stages of manufacture. This East African Standard describes a method for the determination of added oil in sisal or jute, based on the extraction of the oil by an organic solvent. All organic solvents, however, extract some of the natural constituents of sisal or jute and an allowance has to be made in quantitative determinations of the added oil. The recommended solvent for this method and the procedure used has been found to extract between 0.1 % and 0.2 % of the natural constituents of sisal or jute.

Method for determination of added oil content of sisal or jute yarn or fabric

1 Scope

This Draft East African Standard prescribes a method for determination of added oil content of sisal or jute yarn or fabric or a combination of sisal and jute fabric.

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.

ISO 139, *Textiles — Standard atmospheres for conditioning and testing*

3 Terms and definitions

No terms and definitions are listed in this document.

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>

4 Principle

A known amount of a test specimen is extracted with light petroleum in a soxhlet apparatus under defined conditions. The solvent is removed by distillation and the extract is weighed.

The mass of the extract is expressed as percentage on one of the following basis:

- a) the mass of the test specimen as received;
- b) the mass of the test specimen conditioned in the standard atmosphere for testing of textiles;
- c) the dry mass of the extracted test specimen;
- d) the dry mass of the extracted test specimen with the addition of the recommended allowance for moisture and natural or added solvent-soluble matter.

5 Reagent

Light petroleum, redistilled, boiling range 40 °C to 60 °C.

6 Apparatus

- 6.1 **Soxhlet extractors**, 200 ml to 300 ml capacity.
- 6.2 **Extraction flasks**, flat-bottomed, 250 ml to 500 ml capacity.
- 6.3 **Double-surface or coin type reflux condensers.**
- 6.4 **Heating unit**, temperature-controlled, for use with soxhlet extractors.
- 6.5 **Distillation unit**, e.g. water or steam bath.
- 6.6 **Balance**, accurate to within 0.2 mg.
- 6.7 **Stoppered** weighing bottles.
- 6.8 **Soxhlet thimbles**, previously extracted with the solvent.
- 6.9 **Desiccator.**
- 6.10 **Ventilated oven**, for drying test specimens at $105\text{ °C} \pm 3\text{ °C}$.
- 6.11 **Suction pump and adapter**

7 Conditioning

If the result is to be expressed on the mass of the conditioned test specimen, condition the test specimen in the standard atmosphere for testing of textiles as described in ISO 139.

If the result is to be expressed on any other basis (see 4), conduct the test in ordinary laboratory conditions.

8 Test sample and test specimen

8.1 Test sample

Sample at random, a test sample, representative of the bulk and of sufficient size for at least two test specimens each weighing 5 g to 20 g. Determine the mass of the test specimen.

8.2 Test specimens

If the result is to be expressed on the basis of the test sample as received, divide the test sample into test specimens and place each test specimen in a separate weighing bottle (see 6.7) and stopper the bottle. Weigh the bottles with their test specimens, and calculate the mass of each test specimen.

8.3 Conditioned test specimens

If the result is to be expressed on the basis of the mass of the conditioned test specimen divide the test sample into test specimens and place each in a separate weighed weighing bottle (see 6.7). Condition the test specimen by placing the open bottle in an enclosure at the standard atmosphere for testing of textiles for 24 hours. Stopper the bottle. Weigh the bottle and test specimen, and calculate the mass of the conditioned test specimen.

NOTE The weighing need not be made in the standard atmosphere for testing of textiles.

8.4 Dry extracted test specimen

If the result is to be expressed on the mass of the dry, extracted test specimen, condition the test sample, before taking the test specimens, in the ordinary laboratory atmosphere for 24 h.

9 Procedure

Place the test specimens in a thimble (6.8) in a soxhlet extractor (6.1). Add approximately 200ml of light petroleum (5) to a clean, dry extraction flask (6.2), previously weighed to an accuracy of 0.001 g, and carry out the extraction for a time such that the extractor siphons at least ten times. Disconnect the apparatus and remove the bulk of the solvent by distillation (6.5). Remove the remainder of the solvent by the following method. Connect the flask (6.2) by means of a suitable adapter to a suction pump (6.11). Reduce the pressure in the flask to 1.33 kPa to 4.00 kPa for not less than 12 min and not more than 15 min while warming the flask at 60 °C to 65 °C. Release the vacuum through a side tube fitted with a cotton wool filter before disconnecting the adapter.

If the pressure of 1.33 kPa to 4.00 kPa cannot be obtained, pass a stream of air through the flask using the following method. Stopper the flask with a stopper containing an inlet and outlet tube, neither of which projects below the neck of the flask. Heat the flask on a water bath at 60 °C to 65 °C, and by means of a vacuum supply draw a stream of air (300 ml/min measured at atmospheric pressure) through the flask for 15 min, with the pressure inside the flask reduced to 26.60 kPa.

If the result is required on the basis of the dry mass of the extracted test specimen or of the mass of the test sample as received, remove the thimble from the soxhlet extractor, allow the solvent to evaporate and transfer the extracted test specimen to a tared weighing bottle. Dry the test specimen and bottle in an oven at 105°C ± 3 °C for at least 3 h, cool in a desiccator (6.9) and determine its mass.

10 Calculation and expression of results

10.1 General

Calculate the mass of the dry extract as a percentage of the mass of a test specimen by one of the methods detailed in 10.2 to 10.5. Express the result as the average (mean) for two or more test specimens.

Express all results to the nearest 0.1%.

NOTE In all formulae the recommended value for (a) is 17.0 and the recommended value of (b) is 0.15.

10.2 Method based on the test specimen as received

Calculate the percentage of added oil, P, (%) of the test specimen as received using the following expressions.

$$P = \frac{100 m}{M} - b$$

Where;

M is the mass of the test specimen as received (in g).

b is the percentage of naturally occurring oil and wax in the test specimen, removed during the extraction;

m is the mass of the extract (in g);

10.3 Method based on the conditioned mass of a test specimen

Calculate the percentage of added oil, P_o , using the following expression:

$$P_o = \frac{100 m}{M_o} - b$$

where

b is the percentage of naturally occurring oil and wax in the test specimen, removed during extraction;

m is the mass of extract (in g)

M_o is the conditioned mass of the test specimen (in g).

10.4 Method based on the dry mass of extracted test specimen

Calculate the percentage of added oil, P_d , using the following expression:

$$P_d = \frac{100 m}{M_d} - b$$

where

b is the percentage of naturally occurring oil and wax in the test specimen, removed during extraction;

m is the mass of the extract (in g);

M_d is the dry mass of the extracted test specimen (in g).

10.5 Method based on the dry mass with the addition of recommended allowance for moisture and natural or added solvent-soluble matter.

Calculate the percentage of added oil on the bases of dry mass plus allowance, P_r , using the following expression:

$$P_r = \frac{100P_d}{100 + a}$$

where

a is the recommended allowance for moisture and natural or added solvent-soluble matter

P_d is the percentage of added oil based on dry mass.

11 Test report

The test report shall include the following information:

- a) reference to this East African Standard;
- b) a description or reference of the sample tested;
- c) the basis on which the test results were calculated;
- d) the individual results and their mean; expressed as in clause 10;

- e) any departure from the method described, e.g. owing to insufficient material being available.

Public Review Draft

Bibliography

EAS 246:2001, Method for determination of added oil content of sisal or jute yarn or fabric

