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EAST AFRICAN STANDARD

Roasted coffee beans and roasted ground coffee— 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. XXXXXX.

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 002, *Coffee, tea, cocoa 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 105:2008), which has been technically revised.

Roasted coffee beans and roasted ground coffee — Specification

1 Scope

This Draft East African Standard specifies the requirements and methods of sampling and test for roasted coffee beans and roasted ground coffee. This standard applies to decaffeinated roasted ground coffee.

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.

AOAC 2000.09, *Ochratoxin A in roasted coffee, Immunoaffinity Column HPLC Method*

AOAC 999.10, *Lead, Cadmium, Zinc, Copper, and Iron in Foods*

CODEX STAN 192, *General Standard for Food Additives*

EAS 130, *Green coffee beans — Specification*

EAS 38, *General Standard for the Labelling of Pre-packaged Foods*

EAS 39, *Hygiene in the food and drink manufacturing industry — Code of practice*

ISO 11294, *Roasted ground coffee — Determination of moisture content -- Method by determination of loss in mass at 103 degrees C (Routine method)*

ISO 20481, *Coffee and coffee products — Determination of the caffeine content using high performance liquid chromatography (HPLC) — Reference method*

ISO 21527-2, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of yeasts and moulds — Part 2: Colony count technique in products with water activity less than or equal to 0.95*

ISO 3509, *Coffee and coffee products — Vocabulary*

ISO 4832, *Microbiology of food and animal feeding stuffs — Horizontal method for the enumeration of coliforms — Colony-count technique*

ISO 4833-1, *Microbiology of the food chain — Horizontal method for the enumeration of microorganisms — Part 1: Colony count at 30 degrees C by the pour plate technique*

ISO 6579-1, *Microbiology of the food chain — Horizontal method for the detection, enumeration and serotyping of Salmonella — Part 1: Detection of Salmonella spp.*

ISO 6670, *Instant coffee — Sampling method for bulk units with liners*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3509 and the following apply.

3.1

roasted coffee beans

product obtained by roasting green coffee

3.2

roasted ground coffee

product obtained by grinding roasted coffee beans

3.3

decaffeinated coffee

coffee from which caffeine has been removed by extraction

4 Requirements

4.1 General requirements

4.1.1 Roasted coffee beans and roasted ground coffee shall be made from Green coffee complying DEAS 130

4.1.2 Roasted coffee beans and roasted ground coffee shall be free from:

- a) extraneous and foreign matter;
- b) foreign odour;
- c) fungal infestation; and
- d) living insects, moulds, dead insects, insect fragments and rodent contamination visible to the naked eye.

4.2 Specific requirements

Roasted coffee beans and roasted ground coffee shall comply with specific requirements given in Table 1 when tested in accordance with test methods specified therein.

Table 1 — Specific requirements for roasted coffee beans and roasted ground coffee

S/N	Characteristic	Requirement	Test method
i.	Moisture, % by mass, max.	5.0	ISO 11294
ii.	Total ash, % by mass	2.0 – 5.0	Annex A
iii.	Acid insoluble ash, % by mass, max	1.0	Annex B
iv.	Water soluble matter, % by mass	25 – 32	Annex C
v.	Alkalinity of water soluble ash in millilitres of 0.1 N hydrochloric acid per gram of material	3.5 – 7.0	Annex D
vi.	Caffeine, % by mass, min.	0.8	ISO 20481
		0.1 max. for decaffeinated	

		ground coffee	
vii.	Petroleum ether extract, % by mass, min.	8.5	Annex E

4.3 Particle size

Roasted ground coffee may comply with particle size requirements in Table 2.

Table 2 — Particle size of roasted ground coffee

Type	% by weight retained on 710-microns sieve	% by weight retained on 500-microns sieve	% by weight retained on 355-microns sieve
Fine	10	15	50
Medium	20	20	30
Coarse	30	25	15

5 Food additives

Roasted coffee beans and roasted ground coffee may contain only permitted food additives stated in CODEX STAN 192.

6 Hygiene

6.1 Roasted coffee beans and roasted ground coffee shall be processed, packaged, stored and distributed under hygienic conditions in accordance with EAS 39.

6.2 Roasted coffee beans and roasted ground coffee shall not exceed the microbiological limits in Table 3.

Table 3 — Microbiological limits for roasted coffee and roasted ground coffee

S/N	Microorganism	Limit	Test method
i.	Total plate count , cfu/ g, max	10 ³	ISO 4833-1
ii.	Coliforms cfu/ g max.	<10	ISO 4832
iii.	<i>Salmonella spp</i> per 25 g max.	Absent	ISO 6579-1
iv.	Yeast and moulds cfu/ g, max	10 ²	ISO 21527-2

7 Contaminants

7.1 Heavy metals

Roasted coffee beans and roasted ground coffee shall not exceed the maximum limits of heavy metals in table 4.

Table 4 — Heavy metals limits

S/N	Heavy metal .	Limits(mg/kg) max	Test method
i.	Lead	0.5	AOAC 999.10
ii.	Cadmium	0.1	

7.2 Mycotoxin

When tested in accordance with AOAC 2000.09, Ochratoxin A in roasted coffee beans and roasted ground coffee shall not exceed 5 µg/kg.

7.3 Pesticide residues

Roasted coffee beans and roasted ground coffee shall not contain levels of pesticide residues in excess of limits established by Codex Alimentarius Commission.

8 Packaging

Roasted coffee beans and roasted ground coffee shall be packaged in food grade containers which safeguard the quality of the product.

9 Labelling

The labelling of the coffee shall comply with EAS 38. In addition, the following information shall be legibly and indelibly marked on the container:

- a) name of the product as roasted coffee beans or roasted ground coffee;
- b) declaration of decaffeinated coffee;
- c) name, location and physical address of the manufacturer;
- d) country of origin;
- e) declaration of food additives, if used;
- f) date of manufacture;
- g) expiry date;
- h) declaration of particle size;
- i) instructions for storage and use;
- j) net content; and
- k) batch/lot number.

10 Sampling

Sampling of roasted coffee beans and roasted ground coffee shall be done in accordance with ISO 6670.

Annex A (normative)

Determination of total ash

A.1 Procedure

Weigh accurately about 5 g of the material in a platinum dish. Heat at $100\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ until water is expelled and then heat slowly over a flame until swelling ceases. Ignite in a muffle furnace at $550\text{ }^{\circ}\text{C} \pm 10\text{ }^{\circ}\text{C}$ until grey ash results. Cool the dish in a desiccator and weigh. Repeat this process of heating for 30 min, cooling in a desiccator, and weighing until the difference between two successive weighing is less than one milligram. Record the lowest mass.

NOTE Preserve the dish containing this ash for the determination of acid insoluble ash.

A.2 Calculation

$$\text{Total ash (on dry basis)} = \frac{10\,000(m_2 - m)}{(m_1 - m)(100 - H)} \text{ per cent by mass}$$

where,

m_2 is the mass in g of the dish with the ash

m is the mass in g of the empty dish

m_1 is the mass in g of the dish with the material (coffee powder)

H is the percentage of moisture.

Annex B (normative)

Determination of acid insoluble ash

B.1 Reagent

Dilute hydrochloric acid, approximately 5 N, prepared from concentrated hydrochloric acid.

B.2 Procedure

B.2.1 Add 25 mL of dilute hydrochloric acid to the ash contained in the dish

B.2.2 Cover the dish with a watch-glass and heat it on a water-bath for 10 min

B.2.3 Allow to cool and filter the contents of the dish through Whatman filter paper No. 42 or its equivalent.

B.2.4 Wash the filter paper till the washings are free from the acid.

B.2.5 Return the filter paper and the residue to the dish. Keep it in an electric air-oven maintained at 135 °C ± 2 °C for about 3 h. Ignite in a muffle furnace, cooling and weighing at half-hour intervals until the difference in weight between the two successive weighing at half-hour intervals until the difference in weight between the two successive weighing is less than one milligram.

B.2.6 Record the lowest mass.

B.3 Calculation

Calculate the acid insoluble as (on dry basis) as follows:

$$\text{acid insoluble on dry basis} = \frac{10\,000(W_2 - W)}{(W_1 - W)(100 - M)}$$

where,

W_2 is the mass in g of dish with acid insoluble as

W is the mass in g of empty dish

W_1 is the mass in g of dish with the material

M is the percentage of moisture

Annex C (normative)

Determination of water soluble matter

C.1 Procedure

Weigh accurately about 2 g of the material in a 500-mL Erlenmeyer flask and add 200 mL of water and reflux over a low flame for one hour. Cool and filter through a Whatman filter paper No. 1 or its equivalent, wash three times with 10 mL to 15 mL of water finally make up to 250 mL in a graduated flask. Shake well and pipette a 50 mL aliquot in a tared dish and evaporation, dry for one hour in an oven at $100\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$, cool in a desiccator and weigh. Repeat this process of heating for 30 min, cooling in a desiccator and weighing until the loss in mass between two successive weighing is less than one milligram. Record the lowest mass.

C.2 Calculation

$$\text{Water soluble matter (on dry basis)} = \frac{50000(m_2 - m_1)}{m(100 - H)}$$

where,

m_2 is the mass in g of the dish with the dried water soluble matter,

m_1 is the mass in g of the empty dish,

H is the percentage of moisture as determined in Annex F, and

m is the mass in g of the material in Erlenmeyer flask.

Annex D (normative)

Determination of alkalinity of soluble ash

D.1 Reagents

Standard hydrochloric acid, dissolve 0.5 g of methyl orange in 500 mL of distilled water. Filter, if necessary.

D.2 Procedure

D.2.1 Titrate the filtrate obtained in Clause B.1 with standard hydrochloric acid, using the methyl orange indicator. Note the volume in millilitres of the acid used.

D.2.2 Calculate the quantity of 0.1 N hydrochloric acid required to neutralize the water soluble ash from one gram of the dry material.

Annex E (normative)

Determination of petroleum ether extract

E.1 Apparatus

Soxhlet extraction apparatus

E.2 Reagent

Petroleum ether, distilling below 60 °C.

E.3 Procedure

Weigh accurately about 10 g of the material in a suitable thimble and dry for 2 h at 100 °C ± 2 °C. Place the thimble in the soxhlet extraction apparatus and extract with the solvent for about 16 h. Dry the extract contained in the Soxhlet flask, the empty weight of which has been previously determined, at 95 °C to 100 °C for an hour. Cool in a desiccator and weigh. Continue the alternate drying and weighing at 30 min intervals until the loss in weight between two successive weighings is not more than one milligram. Record the lowest weight.

E.4 Calculation

Petroleum ether extract (on dry basis):

$$\% \text{ by weight} = \frac{10000(W_1 - W_2)}{W(100 - M)}$$

where

W_1 is the mass in g of Soxhlet flask with the petroleum ether extract

W_2 is the mass in g of Soxhlet flask, clean and dry

W is the mass in g of the material taken for test

M is the percentage of moisture.

Bibliography

- [1] EAS 105:2008, *Roasted coffee beans and roasted ground coffee, Green coffee beans— Specification*

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