

DRAFT UGANDA STANDARD

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Food grade nitrogen — Specification



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Foreword

Uganda National Bureau of Standards (UNBS) is a parastatal under the Ministry of Trade, Industry and Cooperatives established under Cap 327, of the Laws of Uganda, as amended. UNBS is mandated to co-ordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO) and
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- (c) the National Enquiry Point on TBT Agreement of the World Trade Organisation (WTO).

The work of preparing Uganda Standards is carried out through Technical Committees. A Technical Committee is established to deliberate on standards in a given field or area and consists of key stakeholders including government, academia, consumer groups, private sector and other interested parties.

Draft Uganda Standards adopted by the Technical Committee are widely circulated to stakeholders and the general public for comments. The committee reviews the comments before recommending the draft standards for approval and declaration as Uganda Standards by the National Standards Council.

The committee responsible for this document is UNBS/TC 2 [*Food and Agriculture standards*], Subcommittee SC 6, [*Food Additives and contaminants*].

Food grade nitrogen — Specification

1 Scope

This Draft Uganda Standard specifies requirements and methods of sampling and test for food grade nitrogen.

2 Normative references

The following referenced documents are referred to in the text in such a way that some or all 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.

US 277, *General standard for the labelling of food additives when sold as such*

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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>

food grade material

material, made of substances that are safe and suitable for their intended use and which will not impart any toxic substance or undesirable odour or flavour to the product

4 Requirements

4.1 General requirements

Food grade nitrogen shall:

- a) be a colourless, odourless gas or liquid; and
- b) extinguish any flame in its atmosphere.

4.2 Specific requirements

Food grade nitrogen shall comply with the specific requirements given in Table 1 when tested in accordance with the test methods specified therein.

Table 1 — Specific requirements for food grade nitrogen

S/N	Characteristic	Requirement	Test method
i)	Percentage purity, %v/v, min.	99.0	Annex B
ii)	Oxygen, %v/v, max.	1.0	Annex C
iii)	Carbon monoxide, µl/l, max.	10	Annex D

5 Packaging

Food grade nitrogen shall be packaged in clean, sound, leak-proof compressed cylinders made of food grade materials.

6 Weights and Measures

The weight of the packages shall comply with the Weights and Measures Regulations of Uganda.

7 Labelling

In addition to the requirements of US 277, the product shall be legibly and indelibly labelled with the following information:

- a) name of the product as: "Food grade Nitrogen"
- b) Lot/batch identification
- c) best before date;
- d) Name and physical address of the manufacturer/distributor;
- e) instructions of use;
- f) storage instructions; and
- g) precautions for handling and storage.

8 Sampling

Representative samples of the product shall be drawn in accordance with the procedure elaborated in Annex A.

Annex A (normative)

Sampling of nitrogen

A.1 Scale of sampling

A.1.1 Lot — In any consignment, all cylinders packaged during one production cycle shall constitute a lot.

A.1.2 The number (n) of cylinders to be selected from each lot shall depend on the lot size (N) and shall be obtained as indicated in Table A-1.

Table A-1 — Scale of sampling for nitrogen

Lot size N	Sample n
Up to 50	5
51 – 100	8
101 – 150	15
151 – 300	20
301 and above	25

A.1.3 The cylinders shall be selected at random.

A.2 Test samples

One sample of gas shall be drawn from each cylinder selected as in Table A-1 above and shall be the individual test sample from each cylinder.

A.3 Number of tests

All the individual test samples from each lot prepared as in A.2 shall be tested separately for all the requirements given in Table 1.

A.4 Criterion for conformity

B-4.1 A lot shall be declared as conforming to the requirements of this standard when all the individual test results satisfy the relevant requirements given in Table 1.

Annex B (normative)

Assay: Percentage purity by gas chromatography

B.1 Apparatus

B.1.1 Gas chromatography conditions

Column

- Material: stainless steel
- Length: 2 m
- Internal diameter: 2 mm
- Packing material: appropriate molecular sieve capable of absorbing molecules with diameters up to 0.5 nm.

Carrier

- Gas: helium (not less than 99.995 % (v/v) of He)
- Flow: 40 ml/min
- Detector: thermal conductivity detector
- Injector: loop injector
- Column temperature: 50 °C
- Detector temperature: 130 °C
- Reference gas (a): ambient air
- Reference gas (b): Nitrogen (not less than 99.999 % (v/v) of N₂, less than 1 ppm CO, less than 5 ppm O₂)

B.1.2 Procedure

Inject reference gas (a). Adjust the injected volumes and operating conditions so that the height of the peak due to nitrogen in the chromatogram is at least 35 % of full scale of the recorder.

The assay is not valid unless the chromatograms obtained show a clear separation of oxygen and nitrogen.

Inject the gas to be examined and the reference gas (b). In the chromatogram obtained with the gas to be examined, the area of the principal peak is at least 99.0 % of the area of the principal peak in the chromatogram obtained with reference gas (b).

Annex C (normative)

Test for oxygen

C.1 Apparatus

C.1.1 An Oxygen analyser with an electrochemical cell and a detector scale ranging from 0 $\mu\text{l/l}$ to 100 $\mu\text{l/l}$.

C.1.2 Pressure regulator

C.1.3 Airtight metal tubes

NOTE: The analyser shall be calibrated according to the manufacturer's instructions.

C.2 Reagents

Aqueous potassium hydroxide solution

C.3 Procedure

The sample of the gas to be examined is passed through a detection cell containing an aqueous solution of potassium hydroxide. Oxygen in the sample gas produces variation in the electrical signal recorded at the outlet of the cell that is proportional to the oxygen content.

Pass the gas through the analyser using a suitable pressure regulator and airtight metal tubes and operating at the prescribed flow-rates until constant readings are obtained.

Annex D
(normative)

Test for carbon monoxide

D.1 Apparatus

D.1.1 Carbon monoxide detector tube

D.2 Procedure

Pass 1050 ± 50 ml of the gas sample through a carbon monoxide detector tube at the rate specified for the tube. The indicator change corresponds to not more than $10 \mu\text{l/l}$.

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Bibliography

- [1] IS: 1747–1972, specification for nitrogen (Reaffirmed in 2010)
- [2] Nitrogen, JECFA Specification (1999)

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Certification marking

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