

DRAFT UGANDA STANDARD

Second Edition
2017-mm-dd

Urea fertilizer grade — Specification



Reference number
DUS 756

© UNBS 2017

Compliance with this standard does not, of itself confer immunity from legal obligations

A Uganda Standard does not purport to include all necessary provisions of a contract. Users are responsible for its correct application

© UNBS 2017

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilised in any form or by any means, electronic or mechanical, including photocopying and microfilm, without prior written permission from UNBS.

Requests for permission to reproduce this document should be addressed to

The Executive Director
Uganda National Bureau of Standards
P.O. Box 6329
Kampala
Uganda
Tel: +256 414 333 250/1/2/3
Fax: +256 414 286 123
E-mail: info@unbs.go.ug
Web: www.unbs.go.ug

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Requirements	1
4.1 General requirements	1
4.2 Specific requirements	2
4.3 Heavy metal contamination	2
5 Packaging	2
6 Weights and Measures regulations	2
7 Labelling	2
8 Sampling	3
Annex A (normative) DETERMINATION OF MOISTURE	4
A.1 KARL FISCHER METHOD	4
A.2 APPARATUS	4
A.3 REAGENTS	4
A.4 PROCEDURE	4
A.4.1 Standardization of KF reagent	4
A.4.2 Determination of moisture of sample	4
A.5 CALCULATION	5
Bibliography	6

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 coordinate the elaboration of standards and is

- (a) a member of International Organisation for Standardisation (ISO) and
- (b) a contact point for the WHO/FAO Codex Alimentarius Commission on Food Standards, and
- (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 Technical Committee UNBS/TC 2, *Food and agriculture*, Subcommittee SC 20, *Agrochemicals and veterinary drugs*.

This second edition cancels and replaces the first edition (US 759:2007), which has been technically revised.

Urea fertilizer grade — Specification

1 Scope

This Draft Uganda Standard specifies the requirements, sampling and test methods for urea fertilizer grade.

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 976.01 *Biuret in fertilizers. Atomic absorption spectrophotometric method*

ISO 5315, *Fertilizers— Determination of total nitrogen content — Titrimetric method after distillation*

ISO 8157, *Fertilizers and soil conditioners — Vocabulary*

ISO 8397, *Solid fertilizers and soil conditioners — Test sieving*

ISO 8633, *Solid fertilizers — Simple sampling method for small lots*

ISO 8634, *Solid fertilizers — Sampling plan for the evaluation of a large delivery*

ISO 17318, *Fertilizers and soil conditioners — Determination of arsenic, cadmium, chromium, lead and mercury contents*

ISO 18643, *Fertilizers and soil conditioners — Determination of biuret content of urea-based fertilizers — HPLC method*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8157, *Fertilizers and soil conditioners — Vocabulary* 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>

4 Requirements

4.1 General requirements

- a) The fertilizer shall be in the form of a free-flowing crystal, powder, granules or prills, generally white in colour and free from any visible impurities.

- b) Particle size: Not less than 90 % of the material shall pass through 4 mm IS sieve and be retained on 1 mm IS sieve. Not more than 5 % shall be below 1 mm size when tested in accordance with ISO 8397.

4.2 Specific requirements

The fertilizer shall conform to the requirements given in Table 1 when tested in accordance with the methods specified therein.

Table 1 — Chemical composition requirements for urea

SN	Characteristic	Requirement	Method of test
(i)	Total nitrogen, percent by mass, min	46	ISO 5315
(ii)	Biuret, percent by mass, max.	1.5	ISO 18643/AOAC 976.01.
(iii)	Moisture, percent by mass, max	1.0	Annex A

4.3 Heavy metal contamination

When tested in accordance with the methods specified therein, the heavy metal contaminants shall not exceed those indicated in Table 2

Table 2 — Limits for heavy metal contaminants

Metal	Maximum limits, mg/kg	Test methods
Arsenic	20	ISO 17318
Cadmium	7	
Mercury	0.1	
Lead	30	
Chromium	500	

5 Packaging

Urea fertilizer shall be packaged in materials that ensure the product integrity and quality and protect it against physical damage, chemical and moisture contamination.

6 Weights and Measures regulations

The fill of the package shall comply with the weights and measures act

7 Labelling

The following information shall be clearly and indelibly marked in English on each package or container:

- a) name of the fertilizer as “Calcium ammonium nitrate”;

- b) name, address and physical location of manufacturer/packer/importer;
- c) chemical composition of the fertilizer;
- d) nitrogen content of the material as a percentage by weight;
- e) date of manufacture;
- f) expiry date;
- g) batch/lot number;
- h) the net weight of the fertilizer in the package; in metric units;
- i) storage and handling instructions;
- j) risk warning;
- k) instructions for use;
- l) disposal instructions and;
- m) country of origin.

8 Sampling

Sampling shall be done in accordance with ISO 8633 and ISO 8634

Annex A (normative)

DETERMINATION OF MOISTURE

A.1 KARL FISCHER METHOD

This method is applicable to fertilizers like CAN, Urea and urea based complexes. This method is not suitable for phosphate rock based fertilizers and fertilizers containing monocalcium phosphate, calcium sulphate, alkali carbonates as well as aldehydes and ketone groups.

A.2 APPARATUS

Karl Fischer titrator

A.3 REAGENTS

A.3.1 Karl Fischer reagent (KF) – Karl Fischer solution (pyridine free) (single solution)

A.3.2 Di-sodium tartarate dihydrate ($\text{Na}_2\text{C}_4\text{O}_6\cdot 2\text{H}_2\text{O}$) analytical grade

A.3.2 Methanol-KF grade/spectroscopy grade containing less than 0.05 % water

A.4 PROCEDURE

A.4.1 Standardization of KF reagent

- a) Set up the instrument as per manufacturer's manual.
- b) Add methanol to the titration vessel until the electrodes are dipped and titrate with Karl- Fischer reagent to a pre-set end point persists for 30 seconds.
- c) Add 100mg of the disodium tartarate dehydrate to the titration vessel carefully and titrate with Karl Fischer reagent to a pre-set end point (the pre-set end point should persist for 30 seconds). Note the volume of KF reagent used as V_1 mL.

A.4.2 Determination of moisture of sample

- a) Weigh accurately 1 g of the prepared sample and transfer to the titration vessel carefully and stir until dispersed.
- b) Titrate with KF reagent to the same pre-set end point as above and note the volume of KF reagent used as V_2 mL.

A.5 CALCULATION

$$\text{Factor (F) (mg H}_2\text{O/1ml of KF reagent)} = \frac{0.1566 \times \text{milligrams of sodium tartaratedihydrate added}}{V_1}$$

$$\text{Moisture per cent by weight} = \frac{F \times V_2 \times 100}{\text{Weight of sample (grams)} \times 1000}$$

DRAFT UGANDA STANDARD FOR PUBLIC REVIEW

Bibliography

- [1] US 756: 2007, *Urea fertilizer grade — Specification*
- [2] FAO Mineral fertilizer Specifications 2010
- [4] Agricultural Chemicals (Control) Act, 2006 (Act No.1 of 2007)
- [5] The Fertilizer Control Regulations, 2010
- [6] AFDC 10 (4467) P3, *Fertilizer — Urea — Specification*

DRAFT UGANDA STANDARD FOR PUBLIC REVIEW

Certification marking

Products that conform to Uganda standards may be marked with Uganda National Bureau of Standards (UNBS) Certification Mark shown in the figure below.

The use of the UNBS Certification Mark is governed by the Standards Act, and the Regulations made thereunder. This mark can be used only by those licensed under the certification mark scheme operated by the Uganda National Bureau of Standards and in conjunction with the relevant Uganda Standard. The presence of this mark on a product or in relation to a product is an assurance that the goods comply with the requirements of that standard under a system of supervision, control and testing in accordance with the certification mark scheme of the Uganda National Bureau of Standards. UNBS marked products are continually checked by UNBS for conformity to that standard.

Further particulars of the terms and conditions of licensing may be obtained from the Director, Uganda National Bureau of Standards.



DRAFT UGANDA STANDARD FOR PUBLIC REVEIW

ICS 65.080

Price based on **nn** pages