
Ammonium sulphate nitrate (ASN) fertilizer — Specification



Table of contents

Page

Foreword	iii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Requirements	2
4.1 Description	2
4.2 Physical	2
4.3 Chemical	2
4.4 Heavy metal contaminants	3
5 Packaging	3
7 Labelling	3
6 Sampling	4
Annex A (normative) Determination of free acidity	5
A.1 Reagents	5
A.2 Procedure	5
A.3 Calculations	5
Bibliography	6

Foreword

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Ammonium sulphate nitrate (ASN) fertilizer — Specification

1 Scope

This Draft African Standard specifies requirements, sampling and test methods for ammonium sulphate nitrate (ASN) fertilizer.

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 2006.03, *Arsenic, cadmium, cobalt, chromium, lead, molybdenum, nickel, and selenium in fertilizers — Microwave digestion and inductively coupled plasma-optical emission spectrometry*

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

EN 12048, *Solid fertilizers and liming materials — Determination of moisture content — Gravimetric method by drying at 105±2 °C*

EN 15750, *Fertilizers — Determination of total nitrogen in fertilizers containing nitrogen only as nitric, ammoniacal and urea nitrogen by two different methods*

EN 16032, *Fertilizers — Extraction and determination of elemental sulfur*

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

ISO 7409, *Fertilizers — Marking — Presentation and declarations*

ISO 8157, *Fertilizers and soil conditioners — Vocabulary*

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

ISO 14820-1, *Fertilizers and liming materials — Sampling and sample preparation — Part 1: Sampling*

ISO 14820-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

ISO 15178, *Soil quality — Determination of total sulfur by dry combustion*

ISO 15604, *Fertilizers — Determination of different forms of nitrogen in the same sample, containing nitrogen as nitric, ammoniacal, urea and cyanamide nitrogen*

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions in ISO 8157 and the following 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>

— IEC Electropedia: available at: <http://www.electropedia.org/>

3.1

ammonium sulfate nitrate

chemically obtained product containing ammonium nitrate and ammonium sulfate as its essential ingredient

4 Requirements

4.1 Description

The fertilizer shall be free-flowing and in a form suitably coated so as to retard caking and moisture absorption. It shall be in the form of uniform granules or crystals and free from any foreign matter.

4.2 Physical requirements

When test sieved in accordance with ISO 8397, not less than 90 %, by mass, of the fertilizer shall be of particles in the size range of 1,0 mm to 4,0 mm.

4.3 Chemical requirements

Ammonium sulphate nitrate fertilizer shall comply with the requirements given in Table 1 when tested in accordance with the test method specified therein.

Table 1 — Chemical requirements for ammonium sulphate nitrate fertilizer

S/N	Characteristic	Requirement % by mass	Test method
i.	Total nitrogen, as N, min.	26.0	ISO 5315
ii.	Nitrate nitrogen content, as N, max.	7.0	EN 15750 ISO 15604
iii.	Ammoniacal nitrogen content, as N, min.	19.0	ISO 25475
iv.	Free acidity, as HNO ₃ , max.	0.015	Annex A

v.	Sulphur content, as S, min.	14.0	ISO 15178 EN 16032
vi.	Mass fraction of Moisture content, max.	1.0	ISO 8189 EN 12048

4.4 Heavy metal contaminants

The heavy metal contaminants, if present, shall not exceed the limits given in Table 2 when tested with methods specified therein.

Table 2 — Heavy metal contaminants limits

S/N	Parameter	Maximum limit mg/kg	Test method
i.	Arsenic, As	20.0	ISO 17318 AOAC 2006.03
ii.	Cadmium, Cd	7.0	
iii.	Mercury, Hg	0.1	
iv.	Selenium, Se	1.0	AOAC 2006.03
v.	Lead, Pb	30.0	ISO 17318 AOAC 2006.03
vi.	Chromium, Cr	500.0	

5 Packaging

Ammonium sulphate nitrate fertilizer shall be packed in clean, non-defective and appropriate containers that will protect its integrity during handling, transportation and storage.

NOTE The product may be also supplied in bulk containers.

6 Labelling

In addition to the labelling requirements of ISO 7409, each container of Ammonium sulphate nitrate fertilizer shall be legibly and indelibly labelled with the following particulars in accordance with Globally Harmonized System (GHS)

- name of the fertilizer as “Ammonium sulphate nitrate (ASN)”;
- name, address and physical location of the manufacturer/ packer/importer;
- the nitrogen and sulphur content of the fertilizer as a percentage by mass;
- the magnesium content as Mg or (MgO);
- calcium oxide content;

DARS 1484:2026(E)

- f) the net weight of the fertilizer in the package or container;
- g) date of manufacture,
- h) expiry date or best before date
- i) country of origin;
- j) lot/batch number; and
- k) instructions for handling, use and storage

7 Sampling

Sampling and sample preparation shall be carried out in accordance with ISO 14820-1 and ISO 14820-2, respectively.

Annex A (normative)

Determination of free acidity

A.1 Reagents

A.1.1 Standard sodium hydroxide solution, 0.02 N

A.1.2 Methyl red – methylene blue mixed indicator, prepared by mixing equal volumes of 0.2 % methyl red solution in alcohol and 0.1 % methylene blue solution in alcohol

A.2 Procedure

Weigh accurately 10 g of the material and dissolve in 100 mL of neutral water at room temperature in a beaker or conical flask. Add 2 drops to 3 drops of the mixed indicator solution (A.1.2) and titrate with the sodium hydroxide solution (A.1.1) until the colour changes from violet to green.

A.3 Calculations

Free acidity, expressed as a percentage by mass of $\text{HNO}_3 = \frac{6.8VT}{m}$

where,

V is the volume, in millilitres, of the standard sodium hydroxide solution used in the titration;

T is the exact normality, of the sodium hydroxide solution, and

m is the mass, in grams, of the test portion.

Bibliography

- [1] KS 51:2013, *Ammonium sulphate nitrate (ASN) fertilizer — Specification*
- [2] US 757:2007, *Ammonium sulphate nitrate fertilizer — Specification*

