AFRICAN STANDARD

DARS 505(E)

Second Edition 2025

Ammonium sulphate (fertilizer grade) — Specification

Reference No. DARS 505:2025(E)
ICS 65.080

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DARS 505:2025

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This African Standard was prepared by the ARSO Technical Committee Number 22 on Agrochemicals (ARSO/TC 22).

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Ammonium sulphate (fertilizer grade) — Specification

1 Scope

This draft African Standard specifies the requirements, method of sampling and test methods for ammonium sulphate fertilizers.

2 Normative references

The following referenced documents are indispensable for the application 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.

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

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

ISO 8157, Fertilizers, soil conditioners and beneficial substances - Vocabulary

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

ISO 10084, *Solid fertilizers — Determination of mineral-acid-soluble sulfate content — Gravimetric method*

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

ISO 25475, *Fertilizers — Determination of ammoniacal nitrogen*

ISO 10390, Soil, treated biowaste and sludge – Determination of pH

3 Terms and Definitions

For the purpose of this standard the terms and definitions in ISO 8157 apply.

4 Requirements

4.1 General

Ammonium sulphate fertilizer shall be in the form of white colour crystals. It shall be soluble in water. The product shall be free flowing and free from all visible impurities.

4.2 Chemical requirements

Ammonium sulphate fertilizer shall comply with the requirements in Table 1.

Table 1 — Chemical requirements for ammonium sulphate fertilizer

Characteristic	Requirement	Method of test
Mass frcation of ammoniacal nitrogen, as N_2, % , minimum	20,5	ISO 25475
Free acidity, as H_2SO_4, maximum	0,05	Annex A
Moisture at 105 °C, % , maximum	0,5	EN 12048
Total sulphur, S, max	24	ISO 10084

4.3 Heavy metals

Heavy metal contaminants if present shall not exceed the level in indicated in Table 2

Table 2 — Heavy metal contaminants limits

Parameter	Maximum limit (mg/kg)	Test method
Arsenic, As	10	ISO 17318
Cadmium, Cd	15	ISO 17318
Mercury, Hg	0,1	ISO 17318
Lead, Pb	10	ISO 17318
Chromium, Cr	50	ISO 17318

5 Sampling and sample preparation

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

6 Packing and labelling

6.1 Packing

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

NOTE The product may also be supplied in bulk containers.

6.2 Labelling

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

a) name of the product
b) name and physical address of manufacturer / distributor/supplier, and registered trade mark, or trade name if any;
c) name and guaranteed percentage of any other nutrient element present
d) net mass, in kg;
e) minimum ammoniacal nitrogen content as N
f) lot identification;
g) country of origin;
h) any marking required by the country of origin or destination.
i) date of production
j) date of expiry

7 Certificate of analysis

A certificate of analysis stating the minimum percentage levels of plant nutrient elements shall accompany every lot or consignment of ammonium sulphate fertilizer

8 Material safety

Each container shall be accompanied by a Material Safety Data Sheet (MSDS) and Technical Data Sheet (TDS)

Annex A
(normative)

Determination of free acid

A.1 Principle

Dissolution of the product in water and the subsequent titration of the solution against standard sodium hydroxide solution in the presence of an indicator.

A.2 Reagents

.2.1 Distilled water, or water of equivalent purity, neutral to the indicator.

A.2.2 Sodium hydroxide, standard volumetric solution c(NaOH) = 0.02 mol/L.

A.2.3 Methyl red - methyl blue mixed indicator solution, prepared by mixing equal volumes of 0.2% solutions in rectified spirit.

A.3 Apparatus

Ordinary laboratory apparatus and in particular, the following:

A.3.1 Burette, of 10 mL capacity, graduated in divisions of 0.05 mL.

A.3.2 Analytical balance, of accuracy 0.001 g.

A.4 Procedure

A.4.1 Test solution

Dissolve about 20 g of the test sample weighed to an accuracy 1 mg in about 50 mL of cold water (B.2.1). Filter into a volumetric flask (250 mL) and take up the solution to 200 mL. The filtering media shall be neutral and shall not contain any alkaline material which should neutralize the free acid.

A.4.2 Determination

Add two drops of the indicator (A.2.3) to the test solution (A.4.1) and titrate, while stirring, with the sodium hydroxide solution (A.2.2) until the indicator changes colour.

A.5 Number of determinations

Carry out two determinations on the same test sample.

B.6 Expression of results

The free acidity, expressed as a percentage by mass of sulphuric acid, is equal to

$$\frac{V \times c \times 98.08}{10 \times m}$$

where

V is the volume, *in* millilitres, of the sodium hydroxide volumetric solution used (A.4.2)

c is the exact concentration, expressed in moles per litre, of the sodium hydroxide volumetric solution used;

m is the mass, in grams, of the test portion (A.4.1)

98.08 is the molar mass of sulphuric acid.