SRI LANKA STANDARD 620 : 2014
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SPECIFICATION FOR
AMMONIUM SULPHATE
(FERTILIZER GRADE)
(First Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR AMMONIUM SULPHATE (FERTILIZER GRADE)
(First Revision)

SLS 620 : 2014

Gr. 4

SRI LANKA STANDARDS INSTITUTION
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SRI LANKA

Sri Lanka Standards are subject to periodical revision in order to accommodate the progress made by industry. Suggestions for improvement will be recorded and brought to the notice of the Committees to which the revisions are entrusted.

This standard does not purport to include all the necessary provisions of a contract.

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SPECIFICATION FOR AMMONIUM SULPHATE (FERTILIZER GRADE)
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FOREWORD

This standard was approved by the Sectoral Committee on Agriculture and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2014-09-25.

This standard was first published in 1983. In this revision sulphur content, as "S" has been included, the maximum limit for Free acidity, (as H_2SO_4) changed, particle size has been introduced for the product and limits have been specified for the potentially toxic elements

Guidelines for the determination of compliance of a lot with the requirements of this standard based on statistical sampling and inspection are given in Appendix **A**.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or an analysis shall be rounded off in accordance with **SLS 102**. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this standard.

In the preparation of this standard, the valuable assistance derived from the following publications are greatly appreciated AGP fertilizer specification of the Food and Agriculture Organization (FAO) of United Nations and the Association of Official Analytical Chemists (AOAC).

1 SCOPE

This standard prescribes the requirements, methods of sampling and test for ammonium sulphate or sulphate of ammonia of fertilizer grade:

2 REFERENCES

SLS 102 Rules for rounding off numerical values
SLS 124 Test sieves
SLS 544 Code of practice for handling and storage of bagged fertilizers
SLS 559 Method for sampling fertilizers
SLS 645 Methods of test for fertilizers
Part 1: Determination of nitrogen content
Part 2: Determination of moisture content
Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC), 18th Edition, 2nd Revision 2007

3 REQUIREMENTS

3.1 General requirements

The material shall as in the form of crystals, white or off – white in colour, free - flowing and shall be free from visible impurities.

3.2 Other requirements

3.2.1 *Particle size*

Not less than 90 per cent of the material shall passes through a sieve of aperture size of 2.80 mm and not more than 05 per cent of the material shall be passes through a sieve of aperture size of 1.0 mm sieve when tested according to the method given in Appendix **B**. The test sieves shall conform to **SLS 124.**

3.2.2 *Moisture and chemical requirements*

The material shall comply with the requirements given in Table **1** when tested according to the methods given in Column **4** of the table.

TABLE 1 - Moisture and chemical requirements for Ammonium Sulphate

SI. No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Ammonical nitrogen content, on dry basis, per cent by mass, min.	21	SLS 645 : Part 1
ii)	Moisture, per cent by mass, max.	1.0	SLS 645 : Part 2
iii)	Free acidity, as H_2SO_4, per cent by mass, max.	0.05	Appendix C
iv)	Sulphur, as S, per cent by mass, min.	23	AOAC 980.02

3.2.3. *Potentially toxic elements*

The material shall also comply with the requirements given in Table **2.**

TABLE 2 – Limits for potentially toxic elements

Sl. No. (1)	Element (2)	Limit (3)	Method of test (4)
i)	Arsenic, as As, mg/kg, max.	0.5	AOAC Official Method 2006.3 ***(See the note)***
ii)	Cadmium, as Cd, mg/kg, max.	0.1	
iii)	Lead, as Pb, mg/kg, max.	0.1	
iv)	Chromium, as Cr, mg/kg, max.	3.0	
v)	Mercury, as Hg, mg/kg, max.	0.1	Atomic Absorption Spectrophotometry after microwave digestion

Note: *Atomic Absorption Spectrophotometry after microwave digestion can be used as an alternative method; AOAC 999.10 for Pb and Cd*

4 PACKAGING AND MARKING

4.1 Packaging

The material shall be suitably packed in sound, strong and moisture-proof multiwall paper bags, jute bags or woven polypropylene bags with polyethylene inner lining having a minimum thickness of 50 µm.

4.2 Marking

4.2.1 The packages shall be legibly and indelibly marked with the following information:

a) Name of the product as, *"AMMONIUM SULPHATE, OR SULPHATE OF AMMONIA (FERTILIZER GRADE)"*, in capital letters;
b) Name and address of the manufacturer/importer/distributor including country of origin;
c) Registered trade mark, if any;
d) Net mass, in kg;
e) Batch or code number;
f) Date, month and the year of manufacture
g) Percentage by mass of ammoniacal nitrogen; and
h) The words "NO HOOK USED" in capital letters.

5. HANDLING AND STORAGE

The handling and storage of the material shall be as prescribed in **SLS 544**.

6. METHODS OF TEST

6.1 Tests shall be carried out as prescribed in AOAC Official Method **AOAC 2006.3, AOAC 999.10, AOAC 980.02** and, **Part 1** and **2** of **SLS 645** and Appendix **B** and **C** of this specification**.**

6.2 Unless otherwise stated, use only reagents of analytical grade and only distilled water or water of equivalent purity.

APPENDIX A
COMPLIANCE OF A LOT

The sampling scheme given in this Appendix should be applied where compliance of a lot to the requirements of this standard is to be assessed based on statistical sampling and inspection.

Where compliance with this standard is to be assessed based on manufacture's control systems coupled with type testing and check tests or any other procedure, an appropriate scheme of sampling and inspection should be adopted.

A.1 SCALE OF SAMPLING

A.1.1. The sampling shall be carried out as prescribed in **SLS 559**.

A.2 NUMBER OF TESTS

A.2.1 Each package selected as prescribed in **SLS 559** shall be inspected for packaging and marking requirements given in **4.**

A.2.2 Tests for the requirements specified in **3** shall be carried out on the composite sample prepared as in **SLS 559.**

A.3 CRITERIA FOR CONFORMITY

A lot shall be declared as conforming to the requirements of this specification if the following conditions are satisfied.

A.3.1 Each package inspected as in **A.2.1** satisfies the relevant requirements.

A.3.2 The test results on the composite sample when tested as in **A.2.2** satisfies the relevant requirements.

A.3.2 Each package tested as in **A.2.2** satisfies the particle size requirements.

APPENDIX B
DETERMINATION OF PARTICLE SIZE

B.1 PROCEDURE

B.1.1 Weigh, to the nearest 0.1 g, 50 g of the material and transfer to a sieve of 2.8 mm aperture size (conforming to **SLS 124**) with the lower receiver attached.

Shake the sieve for 5 minutes, frequently tapping the sides. Disintegrate soft lumps which can be crumbled by the application of the fibers of a soft brush, taking care that the hard part of the brush does not make contact with the sieve, and that the brush is not used to brush particles through the sieve. Brush out the powder in the lower receiver and weigh. Replace the receiver and repeat the shaking and tapping procedure for 2 minutes. Add the material in the receiver to the first portion and weigh. Repeat the process until not more than 0.04 g passes through the sieve during 2 minutes.

B.1.2 Weigh, to the nearest 0.1 g, about 50 g of the material and transfer to a sieve of 1.0 mm aperture size (conforming to **SLS 124**) with the lower receiver attached and proceed as in **B.1.1**.

B.2 CALCULATION

Calculate the mass of the material passed through the sieve as a percentage by mass of the material taken for the test.

APPENDIX C
DETERMINATION OF FREE ACIDITY

C.1 GENERAL

The material is dissolved in water and its acidity is determined by titrating with standard sodium hydroxide solution.

C.2 REAGENTS

C.2.1 *Standard sodium hydroxide solution*, 0.02 N

C.2.2 *Methyl red indicator solution*, dissolve 0.15 g of water-soluble methyl red in 500 ml of water

C.2.3 *Methyl red-methylene blue mixed indicator solution*, prepared by mixing equal volumes of 0.2 per cent solution in rectified spirit of methyl red and 0.1 per cent solution in rectified spirit of methylene blue.

C.3 PROCEDURE

Weigh, to the nearest milligram, about 20g of the sample, and dissolve it in about 50 ml of cold, neutral water. Filter (see Note) and make up the volume to about 200 ml. Titrate with standard Sodium hydroxide solution **(C.2.1)** using one or two drops of methyl red as the indicator **(C.2.2)** If satisfactory end point with methyl red is not obtained, methyl red-methylene blue mixed indicator **(C.2.3)** may be used. Use preferably a micro-burette for this titration.

NOTE *– The filtering medium shall be neutral and shall not contain any alkaline material which would neutralize the free acid.*

C.4 CALCULATION

Free acidity, as $H_2 SO_4$, per cent by mass $= \frac{4.904\ V\ N}{m}$

where;

V is the volume, in ml, of the standard Sodium hydroxide solution, required for the titration;

N is the normality of the standard sodium hydroxide solution; and

m is the mass, in g, of the prepared sample taken for the test.

SLS CERTIFICATION MARK

The Sri Lanka Standards Institution is the owner of the registered certification mark shown below. Beneath the mark, the number of the Sri Lanka Standard relevant to the product is indicated. This mark may be used only by those who have obtained permits under the SLS certification marks scheme. The presence of this mark on or in relation to a product conveys the assurance that they have been produced to comply with the requirements of the relevant Sri Lanka Standard under a well designed system of quality control inspection and testing operated by the manufacturer and supervised by the SLSI *which includes surveillance inspection of the factory, testing of both factory and market samples.*

Further particulars of the terms and conditions of the permit may be obtained from the Sri *Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.*

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SRI LANKA STANDARDS INSTITUTION

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The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

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