

SRI LANKA STANDARD 1131: 2021
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**SPECIFICATION FOR
AMMONIUM PHOSPHATES
(FERTILIZER GRADE)**
(First Revision)

SRI LANKA STANDARDS INSTITUTION

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SLS 1131: 2021

Gr. 5

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SRI LANKA**

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FOREWORD

This standard was approved by the Sectoral Committee on Chemicals and Chemical Technology and was authorized for adoption and publication as a Sri Lanka Standard by the Council of the Sri Lanka Standards Institution on 2021-09-01

Diammonium phosphates are manufactured by reacting ammonia with phosphoric acid.

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 specification is complied with, the final value, observed or calculated, expressing the results of a test or an analysis, shall be rounded off in accordance with **CS 102**. The number of significant places retained in the rounded off value shall be the same as that of the specified value in this specification.

In the preparation of this standard, the assistance derived from the following publication is gratefully acknowledged:

FAO Fertilizer Specification, IS 6448: 1993 Indian standard specification for diammonium phosphate (Second revision)

1 SCOPE

This specification prescribes the requirements, methods of test, marking and packaging for monoammonium phosphate and diammonium phosphates, fertilizer grade.

2 REFERENCES

AOAC Official Method 2006.03

SLS 102 Presentation of numerical values

CS 124 Test sieves

SLS 544 Code of practice for handling and storage of bagged fertilizers

SLS 559 Sampling of fertilizers

SLS 645 Methods of test for fertilizers

Part 1 Determination of nitrogen content

Part 2 Determination of moisture content

Part 5 Determination of phosphorous content

3 TYPES

Ammonium phosphates (granule and powder forms) shall be of the following types:

- a) Monoammonium phosphate; and
- b) Diammonium phosphate.

4 REQUIREMENTS

4.1 General requirements

The material shall be in the form of free-flowing powder or granules and shall be free from visible foreign matter.

4.2 Particle size

4.2.1 Powder

Particle size shall be such that 95 per cent by mass of the material passes through a sieve of 850- μm aperture size and not less than 55 per cent by mass of the material is retained on a sieve of 212- μm aperture size, when tested as given in Appendix **B**. The sieves shall conform to **CS 124**.

4.2.2 Granular

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

4.3 Other requirements

The material shall also comply with the requirements specified in Table 1, when tested according to the relevant methods given in Column 5 of the table.

TABLE 1 - Requirements for ammonium phosphates, fertilizer grade

SL No.	Characteristic	Requirement		Method of test Ref. to SLS 645
		Monoammonium Phosphate	Dianmonium phosphate	
(1)	(2)	(3)	(4)	(5)
i	Ammonical nitrogen percent by mass, min	10	18	Part 1
ii	Total phosphorus (as P ₂ O ₅), per cent by mass, min.	50	46	Part 5
iv	Water soluble phosphorus, of the total phosphorus, as, P ₂ O ₅ , per cent by mass, min.	78	84	Part 5
v	Moisture, per cent by mass, min.	1.0	1.5	Part 2
vi	free phosphoric acid percent by mas maximum	0.1	0.1	Appendix C

4.3.1 *Potentially toxic elements*

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

TABLE 2 – Limits for potentially toxic elements for Ammonium Phosphate fertilizer grade

Sl. No. (1)	Element (2)	Limit (3)	Method of test (4)
i)	Arsenic, as As, mg/kg, max.	25	} AOAC Official Method 2006.03
ii)	Cadmium, as Cd, mg/kg, max.	3.0	
iii)	Lead, as Pb, mg/kg, max.	30	
iv)	Chromium, as Cr, mg/kg, max.	50	
v)	Mercury, as Hg, mg/kg, max.	1.0	

5 PACKAGING AND MARKING

5.1 Packaging

The material shall be supplied in strong, and moisture proof packages or containers. Suitable packages include polypropylene or jute bags with an inner lining of low density polyethylene having a minimum thickness of 50 µm. Materials having barrier properties superior or equal to low density polyethylene of 50 µm thickness can also be used. The material may also be supplied in bulk containers as agreed to between the purchaser and the supplier.

5.2 Marking.

The following shall be legibly and indelibly marked or labelled on each package or container:

- a) Type of the product, in capital letters;
- b) Nitrogen and phosphorus contents, per cent by mass;
- c) Name and address of manufacturer/importer/distributor;
- d) Registered trade mark, if any;
- e) Net mass, in kilograms;
- f) Batch or code number;
- g) Month and year of manufacture; and
- h) The words use *no hooks*, in capital letters.

NOTE

Attention is drawn to certification marking facilities offered by the Sri Lanka Standards Institution. See the inside back cover of the standard.

6 HANDLING AND STORAGE

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

7 METHOD OF TEST

Tests shall be carried out as prescribed in Parts 1,2 and 5 of **SLS 645** and Appendix B of this specification.

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 assured based on manufacturer's control systems coupled with type testing and check tests or any other procedure, appropriate schemes 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.

A.2.2 Tests for the requirements specified in 4 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 satisfy the relevant 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 4.0 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 powder 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 PHOSPHORIC ACID

C.1 REAGENTS

C.1.1. *Acetone*

C.1.2. *Sodium hydroxide*, standard volumetric solution, $c(\text{NaOH}) = 0.1\text{mol/l}$

C.1.3 *Bromocresol green indicator solution* – Dissolve 0.1 g of bromocresol green in 200 ml of 95 per cent (V/V) ethanol or industrial methylated spirit

C.2 PROCEDURE

Weigh to the nearest milligram, approximately 2.5 g of the sample and transfer to a Soxhlet extractor. Add about 100 ml of acetone (**C.1.1**) and extract for three hours. Cool and distill off the acetone as far as possible. Take up the residue with water and make up the volume to 250 ml. Pipette out exactly 100 ml of this solution and titrate with standard sodium hydroxide (**C.1.2**) solution using bromocresol green (**C.1.3**) as an indicator until the colour just changes from yellow to blue.

C.3 CALCULATION

Free phosphoric acid, as P_2O_5 , per cent by mass = $17.75 \left[\frac{V \times c}{m} \right]$

where;

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

m is the mass, in grams, of the sample taken; and

c is the concentration in moles per litre, of the standard sodium hydroxide solution

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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.



SRI LANKA STANDARDS INSTITUTION

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