

SRI LANKA STANDARD 618 : 2014
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SPECIFICATION FOR
UREA (FERTILIZER GRADE)
(First Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
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SLS 618 : 2014

Gr. 4

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Sri Lanka Standard
SPECIFICATION FOR UREA (FERTILIZER GRADE)
(First Revision)

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, the need for specifying limits for potentially toxic substances has been considered and the standard has been prepared accordingly.

This Standard is subject to the restrictions imposed under the Regulation of Fertilizer Act No. 68 of 1988 of Sri Lanka, amendments and the regulations framed thereunder, where applicable.

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 AGP fertilizer specification of the Food and Agriculture Organization (FAO) of the United Nations is gratefully acknowledged;

1 SCOPE

This standard prescribes the requirements and methods of sampling and test for urea 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
 - Part 3 Determination of biuret content
- Official Methods of Analysis of the Association of Official Analytical Chemists (AOAC), 18th Edition, 2nd Revision 2007

3. TYPES

Urea (fertilizer grade) covered in this standard shall be of the following types:

Type 1: Prilled urea

Type 2: Cristal and granular urea

4. REQUIREMENTS

4.1 General requirements

4.1.1 *Prilled urea*

The material shall be white in colour, free flowing and in the form of prills, and shall be free from visible impurities and dust.

4.1.2 *Cristal and granular urea*

The material shall be white in colour, free flowing and in the form Cristal and granul, and shall be free from visible impurities and dust.

4.2 Other requirements

4.2.1 *Particle size*

4.2.1.1 *Particle size for prilled urea*

Not less than 90 per cent of the material shall passes through a sieve of aperture size of 2.36 mm and not more than 05 per cent of the material shall pass through a sieve of aperture size of 1.00 mm when tested according to the method given in Appendix **B**. The sieves shall conform to **SLS 124**.

4.2.1.2 *Particle size for Cristal and granular urea*

Not less than 90 percent of the material shall passes through a sieve aperture size of 4 mm and not more than 5 percent of the material shall passes through a sieve of aperture size of 2 mm when tested according to the method given in Appendix **B**. The test sieves shall conform to **SLS 124**.

4.2.2 *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 urea

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Moisture content, percent by mass, max.	1.0	SLS 645 Part 2
ii)	Total nitrogen content, percent by mass, on dry basis, min.	46	SLS 645 Part 1
iii)	Biuret content, percent by mass, on dry basis, max.	1.0	SLS 645 Part 3

4.2.3 Potentially toxic substances

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

TABLE 2 – Limits for potentially toxic elements for both types

Sl. No. (1)	Element (2)	Requirement (3)	Method of test (4)
i)	Arsenic, as As, mg/kg, max.	0.1	} AOAC Official Method 2006.3 <i>(See the note)</i> Atomic Absorption Spectrophotometry after microwave digestion
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	

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

5 PACKAGING AND MARKING

4.3 Packaging

5.1.1 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.

5.1.2 Each bag shall contain the mass of the product marked on the bag.

4.4 Marking

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

- a) The words, UREA - FERTILIZER GRADE in capital letters;
- b) Registered trade mark, if any;
- c) Name and address of the manufacturer or importer or distributor and country of origin;
- d) Net mass, in kg;
- e) The total nitrogen content, percent by mass (on dry basis).
- f) Batch or code number;
- g) Date, month and the year of manufacture; and
- h) The words “No hook used”

6 HANDLING AND STORAGE

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

7 METHODS OF TEST

7.1 Tests shall be carried out as prescribed in Part 1, Part 2 and Part 3 of **SLS 645** and AOAC Official method 2006.03 or (AOAC) Official method 999.10.

7.2 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 **SLS 559** 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 NUMBER OF TESTS

A.1.1 Each package selected in accordance with **SLS 559** shall be inspected for packaging and marking requirements.

A.1.2 Each package selected in accordance with **SLS 559** shall be tested separately for particle size given in **3.2.1**.

A.1.3 Tests for the requirements given in **3.2.2** and **3.2.3** (if required) shall be carried out on the composite sample prepared as in **SLS 559**.

A.2 CRITERIA FOR CONFORMITY

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

A.2.1 Each package inspected as in **A.1.1** satisfies packaging and marking requirements.

A.2.2 Each package tested as in **A.1.2** satisfies the relevant requirements.

A.2.3 Test results on the composite sample when tested as in **A.1.3** satisfy the relevant requirements.

APPENDIX B DETERMINATION OF PARTICLE SIZE

B.1 PROCEDURE

B.1.1 *Particle size determination for Cristal and granular urea*

B.1.1.1 Weigh, to the nearest 0.1 g, 50 g of the material and transfer to a sieve of 4 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 fibres 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.1.1.2 Weigh, to the nearest 0.1 g, about 50 g of the material and transfer to a sieve of 2 mm aperture size (conforming to **SLS 124**) with the lower receiver attached and proceed as in **B.1.1**.

B.1.2 *Particle size for prilled urea*

B.1.2.1 Carry out the procedure given in **B.1.1.1** using a sieve size of 2.36mm aperture size (conforming to **SLS 124**) with the lower receiver attached.

B.1.2.2 Carry out the procedure given in **B.1.1.2** using the sieve size of 1.00 mm aperture size (conforming to **SLS 124**) with the lower receiver attached.

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.

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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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.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and Administrative control is vested in a Council appointed in accordance with the provisions of the Act.

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All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

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