SRI LANKA STANDARD 1107 : 1995

UDC 631.833

SPECIFICATION FOR POTASSIUM SULFATE (FERTILIZER GRADE)

SRI LANKA STANDARDS INSTITUTION

SPECIFICATION FOR POTASSIUM SULFATE
(FERTILIZER GRADE)

SLS 1107 : 1995

Gr. 5

SRI LANKA STANDARDS INSTITUTION
53, Dharmapala Mawatha,
Colombo 3,
Sri Lanka.

Sri Lanka Standard

SPECIFICATION FOR POTASSIUM SULFATE (FERTILIZER GRADE)

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 1995 - 11- 15.

Sulfate of potash has long been preferred over potassium chloride as a potash source for crops such as tobacco, potato, citrus, etc. which are sensitive to chlorides under certain soil and cropping conditions.

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 greatefully acknowledged:

IS 2764 : 1980 Indian standards specification for potassium sulfate, fertilizer grade (First revision)

1 SCOPE

This specification prescribes the requirements and methods of test for potassium sulfate, fertilizer grade.

2 REFERENCES

CS 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 2 Determination of moisture content
Part 4 Determination of potassium content
Part 7 Determination of sodium content

3 REQUIREMENTS

3.1 General requirements

The material shall be free flowing crystals, white or off white in colour and free from visible foreign matter. It shall be completely soluble in water.

3.2 Particle size

The particle size of the material shall be such that 95 per cent by mass of the material shall be retained on a 250-μm sieve conforming to CS 124, when tested as given in Appendix B.

3.3 Other requirements

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

TABLE 1 - **Requirements for potassium sulfate, fertilizer grade**

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Potash content(as K_2O), per cent by mass, min.	48	SLS 645 : Part 4
ii)	Moisture, per cent by mass, max.	1.0	SLS 645 : Part 2
iii)	Total chlorides (as Cl), per cent by mass, max.	1.0	Appendix C
iv)	Sodium (as NaCl), per cent by mass, max.	2.0	SLS 645 : Part 7

4 PACKAGING AND MARKING

4.1 Packaging

The material shall be supplied in sound, 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 37.5 μm or any other material having barrier properties superior or equal to low density polyethylene of 37.5 μm thickness. The material may also be supplied in bulk containers as agreed to between the purchaser and the supplier.

4.2 Marking

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

a) The words *potassium sulfate, or sulfate of potash, fertilizer grade*, in capital letters ;
b) Potash content, per cent by mass ;
c) Net mass, in kilogram ;
d) Name and address of the manufacturer, importer or distributor ;
e) Registered trade mark, if any ;
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.

5 HANDLING AND STORAGE

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

6 METHODS OF TEST

Tests shall be carried out as prescribed in Parts 2, 4 and 7 of SLS 645 and Appendices B and C 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 packaing and marking requirements.

A.2.2 Tests for the requirements specified in 3 shall be carried out on the composite samples 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 , 100 g of the material and transfer to a sieve of 250-μm aperture size (conforming to CS 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 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. Calculate the mass of the material retained on the sieve as a percentage by mass of the material taken for the test.

APPENDIX C
DETERMINATION OF CHLORIDES

C.1 PRINCIPLE

The chlorides, dissolved in water, are preciptitated in an acid medium by an excess of standard solution of silver nitrate. The excess is titrated with a solution of ammonium thiocyanate in the presence of ferric ammonium sulfate.

C.2 REAGENTS

C.2.1 **Nitrobenzene or diethyl ether**

C.2.2 **Nitric acid, 10 mol/l**

C.2.3 Indicator solution,
Dissolve 40 g of ferric ammonium sulphate [$Fe_2 (SO_4)_3 (NH_4)_2 SO_4 .24H_20$] in water and make up to 1 litre.

C.2.4 Standard silver nitrate, 0.1 mol/l

C.2.5 Ammonium thiocyanate, 0.1 mol/l
Weigh approximately 9 g of ammonium thiocyanate, dissolve in water and make up the volume to 1 litre. Standardize by titrating against silver nitrate solution (C.2.4).

C.3 APPARATUS

C.3.1 Rotary shaker, 35 to 40 turns per minute

C.4 PROCEDURE

C.4.1 Weigh, to the nearest 0.001 g, 5 g of the prepared sample, previously dried for 24 hours in a desiccator and place in a 500-ml graduated flask and add 450 ml of water. Mix for half an hour on the shaker (C.3.1), make up to 500 ml with distilled water, mix and filter into a beaker.

C.4.2 Take an aliquot of the filtrate containing not more than 0.150 g of chloride. If the sample taken is smaller than 50 ml it is necessary to make up the volume to 50 ml with distilled water. Add 5 ml of nitric acid (C.2.2), 20 ml indicator solution (C.2.3), and two drops of ammonium thiocyanate standard solution (C.2.5), from a burette adjusted to zero. Add silver nitrate solution (C.2.4), from a burette until there is an exess of 2 ml to 5 ml silver nitrate solution. Add 5 ml of nitrobenzene or 5 ml of diethyl ether (C.2.1) and shake well to agglomerate the precipitate. Titrate the excess silver nitrate with ammonium thiocyanate (C.2.5) from the burette used initially (without readjusting to zero) until a red-brown colour appears which remains after the flask has been shaken slightly.

NOTE

Nitrobenzene or diethyl ether (especially the former) prevents the silver chloride from reacting with thoicyanate ions, thus a clear colour change is obtained.

C.4.3 Blank test
Make a blank test under the same conditions, omitting the sample, and allow for it when calculating the final result.

C.5 CALCULATION

$$\text{The chlorides (as Cl), per cent, by mass} = \frac{0.003546 \times (V_1 - V_2) - (V_3 - V_4) \times 100}{m}$$

where :

V_1 is volume, in ml, of silver nitrate added ;
V_2 is volume, in ml, of silver nitrate used in the blank test ;
V_3 is volume, in ml, of ammonium thiocyanate used for the titration of the sample ;
V_4 is volume, in ml, of ammonium thiocyanate used for the titration of the blank ; and
m is mass, in g, of the sample in aliquot volume taken for titration.

.....

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.*

Printed at SLSI (Printing Unit)

SRI LANKA STANDARDS INSTITUTION

The Sri Lanka Standards Institution (SLSI) is the National Standards Organization of Sri Lanka established under the Sri Lanka Standards Institution Act No. 6 of 1984 which repealed and replaced the Bureau of Ceylon Standards Act No. 38 of 1964. The Institution functions under the Ministry of Science & Technology.

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.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

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.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.

Printed at the Sri Lanka Standards Institution, 17, Victoria Place, Elvitigala Mawatha, Colombo 08.