SRI LANKA STANDARD 812 : 2014
UDC 661.632.2

SPECIFICATION FOR
TRIPLE SUPER – PHOSPHATE
(FERTILIZER GRADE)
(First Revision)

SRI LANKA STANDARDS INSTITUTION

Sri Lanka Standard
SPECIFICATION FOR TRIPLE SUPER - PHOSPHATE (FERTILIZER GRADE)
(First Revision)

SLS 812 : 2014

Gr. 4

SRI LANKA STANDARDS INSTITUTION
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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.

Sri Lanka Standard
SPECIFICATION FOR TRIPLE SUPER- PHOSPHATE (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 2014-09-02.

This standard was first published in 1988. In this revision, limits have been specified for potentially toxic elements.

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.

Guidelines for the determination of compliance of a lot to 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 related publications are greatly appreciated: AGP fertilizer specification of the Food and Agriculture Organization (FAO) of the United Nations and the Association of Official Analytical Chemists (AOAC).

1. SCOPE

This standard prescribes the requirements and method of sampling and test for triple super-phosphate, 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 2 Determination of moisture content
Part 5 Determination of phosphorous 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 be granular and free - flowing. It shall be free from hard lumps and visible foreign matter.

3.2 Other requirements

3.2.1 *Particle size*

Not less than 90 per cent of the material shall pass through a sieve of aperture size of 4.00 mm and shall be retained on 1.00 mm sieve and not more than 5 per cent shall be below 1.00 mm sieve. 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 triple super-phosphate

Sl. No. (1)	Characteristic (2)	Requirement (3)	Method of test (4)
i)	Moisture, per cent by mass, max.	4	SLS 645:Part 2
ii)	Total phosphorus as, P_2O_5, per cent by mass, min.	46	SLS 645:Part 5
iii)	Water soluble phosphorus, of the total phosphorus, as, P_2O_5, per cent by mass, min.	80	SLS 645:Part 5
iv)	Free phosphoric acid, as, P_2O_5, per cent by mass, max.	3.0	Appendix B

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 for Triple Super 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 2006.3 ***(See the note)***
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	Atomic Absorption Spectrophotometry after microwave digestion

Note: *Atomic Absorption Spectrophotometry after microwave digestion can be used as an alternative metho;, 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.

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

4.2 Marking

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

a) Name of the product as, TRIPLE SUPER-PHOSPHATE, (FERTILIZER GRADE) OR TSP, (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 kilograms;

e) The total phosphorus content and water soluble phosphorus content as, P_2O_5, percent by mass;
f) Date, month and year of manufacture;
g) Batch or code number; 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 **2006.3, AOAC 999.10,** Part, **2 and 5** of **SLS 645** and Appendix **B** 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 **5.**

A.2.2 Tests for the requirements given 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 standard 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 (NaOH) = 0.1mol/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.

CORRIGENDUM NO. 1 TO SLS 812: 2014 ISSUED ON 2014-09-02

SRI LANKA STANDARD SPECIFICATION FOR TRIPLE SUPER – PHOSPHATE (FERTILIZER GRADE) (FIRST REVISION)

3.2.1 ***Particle size***

In line 3, replace the existing text by following;

The test sieves shall conform to SLS 124, and tested as prescribed in Appendix **B**.

TABLE 4

In Column **4** of Table **4**, delete 'Appendix **B**' and substitute 'Appendix **C**'

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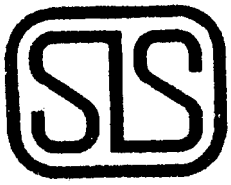

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SRI LANKA STANDARDS INSTITUTION

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