

---

---

**Fertilizers and soil conditioners —  
Sulfur Coated Urea (SCU) — General  
requirements**

*Matières fertilisantes — Urée enrobée de soufre (SCU) — Exigences  
générales*

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[ISO 17323:2015](https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-11d326626f7b/iso-17323-2015)

[https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-  
11d326626f7b/iso-17323-2015](https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-11d326626f7b/iso-17323-2015)



**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO 17323:2015

<https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-11d326626f7b/iso-17323-2015>



**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
Ch. de Blandonnet 8 • CP 401  
CH-1214 Vernier, Geneva, Switzerland  
Tel. +41 22 749 01 11  
Fax +41 22 749 09 47  
[copyright@iso.org](mailto:copyright@iso.org)  
[www.iso.org](http://www.iso.org)

# Contents

Page

Foreword .....	iv
Introduction .....	v
<b>1 Scope .....</b>	<b>1</b>
<b>2 Normative references .....</b>	<b>1</b>
<b>3 Terms and definitions .....</b>	<b>1</b>
<b>4 Requirements .....</b>	<b>2</b>
4.1 Appearance .....	2
4.2 Requirement of sulfur coated urea .....	2
<b>5 Sampling and preparation of test sample .....</b>	<b>2</b>
5.1 Sampling method .....	2
5.1.1 Products in bags .....	2
5.1.2 Products in bulk .....	2
5.2 Reduction of samples .....	3
5.3 Test sample preparation .....	3
<b>6 Marking and labelling .....</b>	<b>3</b>
<b>7 Packaging, transport, and storage .....</b>	<b>4</b>
<b>Annex A (informative) Some examples for SCU .....</b>	<b>5</b>
<b>Bibliography .....</b>	<b>6</b>

**iTeh STANDARD PREVIEW**  
(standards.iteh.ai)

ISO 17323:2015

<https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-11d326626f7b/iso-17323-2015>

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword — Supplementary information](#).

The committee responsible for this document is ISO/TC 134, *Fertilizers and soil conditioners*.

[ISO 17323:2015](#)

<https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-11d326626f7b/iso-17323-2015>

## Introduction

Sulfur Coated Urea (SCU) is a coated slow release fertilizer consisting of urea particles coated with sulfur, which was first developed by the Tennessee Valley Authority's National Fertilizer Development Center (TVA/NFDC), Alabama in 1961, and produced commercially in 1967. SCU is made by coating urea with sulfur and sealant. The main coating material of SCU is sulfur. Sulfur is insoluble in water and its chemical properties are stable, thus it is an impermeable coating material. In addition, sulfur itself is a secondary nutrient and it does not pollute the soil when applied appropriately.

This International Standard specifies general requirements, sampling, and preparation of test sample, marking and labelling, packaging, transport, and storage for SCU.

NOTE Some countries or regions might have published other standards covering requirements for SCU.

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

ISO 17323:2015

<https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-11d326626f7b/iso-17323-2015>

## **iTeh STANDARD PREVIEW** **(standards.iteh.ai)**

ISO 17323:2015

<https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-11d326626f7b/iso-17323-2015>

# Fertilizers and soil conditioners — Sulfur Coated Urea (SCU) — General requirements

## 1 Scope

This International Standard specifies general requirements, sampling and preparation of test sample, marking and labelling, packaging, transport, and storage for SCU.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 7409, *Fertilizers — Marking — Presentation and declarations*

ISO 7410, *Fertilizers and soil conditioners — Final samples — Practical arrangements*

ISO 7742, *Solid fertilizers — Reduction of samples*

ISO 8157, *Fertilizers and soil conditioners — Vocabulary*

ISO 8633, *Solid fertilizers — Simple sampling method for small lots*

ISO 17322, *Fertilizers and soil conditioners — Analytical Methods for SCU*

<https://standards.iteh.ai/catalog/standards/sist/b36be312-9c3c-43cd-bc00-11d326626f7b/iso-17323-2015>

## 3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

### 3.1

#### **sulfur coated urea**

#### **SCU**

coated controlled release fertilizer consisting of urea particles coated with sulfur

Note 1 to entry: The product is usually further coated with a sealant and, if necessary, a conditioner to avoid tackiness from the sealant.

[SOURCE: ISO 8157, 2.2.1.12]

### 3.2

#### **slow-release fertilizers**

fertilizer, of which, by hydrolysis and/or by biodegradation and/or by limited solubility, the nutrients available to plants is spread over a period of time, when compared to a “reference soluble” product, e.g. ammonium sulfate, ammonium nitrate, and urea

[SOURCE: ISO 8157, 2.1.11]

### 3.3

#### **controlled-release fertilizers**

fertilizer in which nutrient release is controlled, meeting the stated release rate of nutrient and the stated release time at a specified temperature

Note 1 to entry: Typical examples are coated fertilizers.

[SOURCE: ISO 8157, 2.1.12]

### 3.4 one day dissolution rate 1DDR

mass percentage of the dissolution nitrogen to total nitrogen, when SCU is put in static water at 38 °C for 24 h

### 3.5 seven day dissolution rate 7DDR

mass percentage of the dissolution nitrogen to total nitrogen, when SCU is put in static water at 38 °C for seven days

## 4 Requirements

### 4.1 Appearance

The product shall be in granules.

### 4.2 Requirement of sulfur coated urea

SCU products shall be tested to demonstrate conformance with all requirements specified in [Table 1](#) and declared values on containers by the methods specified in ISO 17322.

**Table 1 — Requirements of SCU**  
iTech STANDARD PREVIEW  
(standards.iteh.ai)

Item	Requirements
Total Nitrogen (mass fraction)	31 % to 42 %
One Day Dissolution Rate (1DDR)	≤40 %
Seven Day Dissolution Rate (7DDR)	≤60 %
Sulfur (S) (mass fraction)	≥8,0 %
Biuret (mass fraction) <sup>a</sup>	≤1,2 %
Water(H <sub>2</sub> O)(mass fraction) <sup>b</sup>	≤1 %
Particle size (diameter 1,00 mm to 4,75 mm) <sup>b</sup>	≥90 %
NOTE SCU products are characterized according to different nitrogen release time, however, other requirements of SCU specified by the countries or regions shall be followed. See informative <a href="#">Annex A</a> for additional information.	
<sup>a</sup> Regarding biuret content, the related requirements specified by the countries or regions shall be followed.	
<sup>b</sup> The table is only indicative, special water content and particle size values can be negotiated with producers and buyers. The table is indicative as the SCU specification is determined by the customer's specific field and ambient conditions for the selected plant, crop, or vegetation.	

## 5 Sampling and preparation of test sample

### 5.1 Sampling method

#### 5.1.1 Products in bags

Carry out sampling operation by following the procedure described in ISO 8633. Take care to avoid damage to, or destruction of, the coating.

#### 5.1.2 Products in bulk

Carry out sampling operation by following the procedure described in ISO 8633.



## 5.2 Reduction of samples

Mix all the increments (collected as in 5.1) uniformly and promptly to form a single aggregate sample using a device or by hand. The aggregate sample is reduced to about 1 kg by the riffle sample divider method (see ISO 7742:1988, Annex A.2) or the quartering method (see ISO 7742:1988, Annex A.3). Next, divide into two parts for final laboratory samples. The two laboratory samples are put into two clean and dry glass or plastic containers or any other inert material of adequate resistance capable of maintaining the sample in its original condition. The containers shall be fitted with airtight closures. Carry out all the operations described above as rapidly as possible to avoid loss or gain of moisture. Each container shall be secured and sealed following the instruction given in ISO 7410. Each laboratory sample shall be labelled following the instructions given in ISO 7410. The label shall, at minimum, carry the following information:

- a) name of manufacturer;
- b) name of product;
- c) manufacturer's reference and batch number or production date (if available);
- d) lot size;
- e) date of sampling;
- f) place of sampling;
- g) signature of the sampler;
- h) signature and name of the person or his representative on whose premises the sample was taken.

One of the containers is used for further quality analysis, while the other is kept for additional analysis in six months.

## 5.3 Test sample preparation

Select one of the laboratory samples from the two containers obtained in 5.2. Mix the content of the container according to the procedure in ISO 7742. The test sample used for determining total nitrogen, sulfur, biuret, water, and solid content should be reduced to 100 g. Grind this test sample in the grinder until all of the sample has passed through the test sieve of aperture size 0,50 mm. The rest of the content of the container, except the 100 g test sample mentioned above, is used for determination of 1DDR, 7DDR, and particle size. Both of the test samples are put into clean and dry bottles to be used for further analysis.

## 6 Marking and labelling

The marking and labelling should follow the legislation. Further information can be provided if appropriate and when the legislation allows.

Any labelling recommendations should conform to the United Nations "Globally Harmonized System of Classification and Labelling of Chemicals" (GHS) and applicable national or regional adoption thereof.

Anything referring to the labels should refer to the latest version of ISO standards and local/regional legislations.

### 6.1 The following information should appear on the face of the containers:

- a) total nitrogen content;
- b) sulfur content;
- c) date of production;
- d) net mass;