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TECHNICAL SPECIFICATION
SPÉCIFICATION TECHNIQUE
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English Version

Inorganic fertilizers - Determination of specific nutrients

Engrais inorganiques - Détermination des éléments
nutritifs spécifiques

Anorganische Düngemittel - Bestimmung spezifischer
Nährstoffe

This draft Technical Specification is submitted to CEN members for Vote. It has been drawn up by the Technical Committee CEN/TC 260.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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| Contents | Page |
|--|-------------|
| European foreword | 3 |
| Introduction | 4 |
| 1 Scope..... | 5 |
| 2 Normative references..... | 6 |
| 3 Terms and definitions | 7 |
| 4 Sampling and sample preparation | 7 |
| 4.1 Sampling..... | 7 |
| 4.2 Sample preparation | 7 |
| 5 Methods for extraction and determination of specific nutrients | 7 |
| 5.1 Total nitrogen content | 7 |
| 5.2 Ammoniacal nitrogen..... | 8 |
| 5.3 Nitric nitrogen..... | 8 |
| 5.4 Urea nitrogen content | 8 |
| 5.5 Content of nitrogen from IBDU and CDU | 8 |
| 5.6 Cyanamide nitrogen content | 8 |
| 5.7 Methylene-urea and urea formaldehyde nitrogen content..... | 8 |
| 5.8 P ₂ O ₅ content..... | 8 |
| 5.9 K ₂ O content | 8 |
| 5.10 MgO content..... | 8 |
| 5.11 CaO content..... | 9 |
| 5.12 SO ₃ content | 9 |
| 5.13 Na ₂ O content..... | 9 |
| Bibliography | 10 |

European foreword

This document (FprCEN/TS 17757:2021) has been prepared by Technical Committee CEN/TC 260 “Fertilizers and liming materials”, the secretariat of which is held by DIN.

This document is currently submitted to the Vote on TS.

This document has been prepared under a standardization request given to CEN by the European Commission and the European Free Trade Association.

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[kSIST-TS FprCEN/TS 17757:2021](https://standards.iteh.ai/catalog/standards/sist/36a718d3-a3c4-4830-8287-e0e39a952d1b/ksist-ts-fprcen-ts-17757-2021)

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FprCEN/TS 17757:2021 (E)**Introduction**

Regulation (EU) 2019/1009 [1] lays down the rules on the making available on the market of EU fertilizing products and the specific safety and quality requirements for the defined product function categories (PFCs). Inorganic fertilizers have been classified into PFC 1(C).

The specific safety and quality requirements in relation to the following specific nutrients are defined in this document as well as normative references of the test methods to be used in order to measure the compliance with the related requirement in the Regulation (EU) 2019/1009 [1].

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<https://standards.iteh.ai/catalog/standards/sist/36a718d3-a3c4-4830-8287-e0e39a952d1b/ksist-ts-fprcen-ts-17757-2021>

1 Scope

This document specifies references to methods for the determination of the content of the following specific nutrients in inorganic fertilizers:

- the total nitrogen content;
- the ammoniacal nitrogen content;
- the nitric nitrogen content;
- the urea nitrogen content;
- the content of nitrogen from isobutylidenediurea (IBDU) and crotonylidenediurea (CDU);
- the cyanamide nitrogen content;
- the methylene-urea nitrogen content (and urea formaldehyde, if applicable);
- the total P₂O₅ content;
- the water-soluble P₂O₅ content;
- the neutral ammonium citrate soluble P₂O₅ content;
- the water-soluble K₂O content;
- the total MgO content;
- the water-soluble MgO content;
- the total CaO content;
- the water-soluble CaO content;
- the total SO₃ content;
- the water-soluble SO₃ content;
- the total Na₂O content;
- the water-soluble Na₂O content.

This document is applicable to EU fertilizing products classified as PFC 1(C) and PFC 7 as long as the blend only consists of EU fertilizing products classified as PFC 1(C), PFC 2 and PFC 5 as specified in the Regulation (EU) 2019/1009 [1].

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kSIST-TS FprCEN/TS 17757:2021

<https://standards.iteh.ai/catalog/standards/sist/36a718d3-a3c4-4830-8287-e0e39a952d1b/ksist-ts-fprcen-ts-17757-2021>

FprCEN/TS 17757:2021 (E)**2 Normative references**

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1482-1:2007, *Fertilizers and liming materials - Sampling and sample preparation - Part 1: Sampling*

EN 1482-2:2007, *Fertilizers and liming materials - Sampling and sample preparation - Part 2: Sample preparation*

EN 1482-3:2016, *Fertilizers and liming materials - Sampling and sample preparation - Part 3: Sampling of static heaps*

EN 12944-1:1999, *Fertilizers and liming materials and soil improvers - Vocabulary - Part 1: General terms*

EN 12944-2:1999, *Fertilizers and liming materials and soil improvers - Vocabulary - Part 2: Terms relating to fertilizers*

EN 15475:2009, *Fertilizers - Determination of ammoniacal nitrogen*

EN 15476:2009, *Fertilizers - Determination of nitric and ammoniacal nitrogen according to Devarda*

EN 15477:2009, *Fertilizers - Determination of the water-soluble potassium content*

EN 15478:2009, *Fertilizers - Determination of total nitrogen in urea*

EN 15560:2009, *Fertilizers - Determination of total nitrogen in calcium cyanamide nitrate free*

EN 15561:2009, *Fertilizers - Determination of total nitrogen in calcium cyanamide containing nitrates*

EN 15562:2009, *Fertilizers - Determination of cyanamide nitrogen*

EN 15604:2009, *Fertilizers - Determination of different forms of nitrogen in the same sample, containing nitrogen as nitric, ammoniacal, urea and cyanamide nitrogen*

EN 15705:2010, *Fertilizers - Determination of urea condensates using high-performance liquid chromatography (HPLC) - Isobutylidenediurea and crotonylidenediurea (method A) and methylen-urea oligomers (method B)*

EN 15749:2009, *Fertilizers - Determination of sulfates content using three different methods*

EN 15750:2009, *Fertilizers - Determination of total nitrogen in fertilizers containing nitrogen only as nitric, ammoniacal and urea nitrogen by two different methods*

EN 15925:2011, *Fertilizers - Extraction of total sulfur present in various forms*

EN 15926:2011, *Fertilizers - Extraction of water soluble sulfur where the sulfur is in various forms*

EN 15956:2011, *Fertilizers - Extraction of phosphorus soluble in mineral acids*

EN 15957:2011, *Fertilizers - Extraction of phosphorus which is soluble in neutral ammonium citrate*

EN 15958:2011, *Fertilizers - Extraction of water soluble phosphorus*

EN 15959:2011, *Fertilizers - Determination of extracted phosphorus*

EN 15960:2011, *Fertilizers - Extraction of total calcium, total magnesium, total sodium and total sulfur in the forms of sulfates*

EN 15961:2017, *Fertilizers - Extraction of water-soluble calcium, magnesium, sodium and sulfur in the form of sulfates*

EN 16196:2012, *Fertilizers - Manganimetric determination of extracted calcium following precipitation in the form of oxalate*

EN 16197:2012, *Fertilizers - Determination of magnesium by atomic absorption spectrometry*

EN 16198:2012, *Fertilizers - Determination of magnesium by complexometry*

EN 16199:2012, *Fertilizers - Determination of the sodium extracted by flame-emission spectrometry*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12944-1:1999 and EN 12944-2:1999 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

4 Sampling and sample preparation

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4.1 Sampling

Samples taken for quality control purposes shall be representative, as described in EN 1482-1:2007. Sampling of static heaps shall be performed according to EN 1482-3:2016.

4.2 Sample preparation

The sample preparation for quality control purposes shall be performed according to EN 1482-2:2007.

5 Methods for extraction and determination of specific nutrients

5.1 Total nitrogen content

For the determination of the total nitrogen content in calcium cyanamide, nitrate free, use EN 15560:2009.

For the determination of the total nitrogen content in calcium cyanamide, containing nitrates, use EN 15561:2009.

For the determination of the total nitrogen content in urea, use EN 15478:2009.

For the determination of the total nitrogen content in fertilizers containing nitrogen only as nitric, ammoniacal and urea nitrogen, use EN 15750:2009.

For the determination of the total nitrogen content in fertilizers containing various forms, use EN 15604:2009.

FprCEN/TS 17757:2021 (E)

For the determination of the total nitrogen content in fertilizers containing exclusively nitrogen in nitric and ammoniacal form, use EN 15476:2009.

5.2 Ammoniacal nitrogen

For the determination of the ammoniacal nitrogen use EN 15475:2009.

5.3 Nitric nitrogen

For the determination of the total nitrogen content in fertilizers containing exclusively nitrogen in nitric and ammoniacal form, use EN 15476:2009.

5.4 Urea nitrogen content

For the determination of the urea nitrogen content use EN 15604:2009 (not validated for products containing cyanamide nitrogen).

5.5 Content of nitrogen from IBDU and CDU

For the determination of the content of nitrogen from isobutylidenediurea (IBDU) and crotonylidenediurea (CDU) use EN 15705:2010, method A.

5.6 Cyanamide nitrogen content

For the determination of the cyanamide nitrogen content in fertilizers, use EN 15562:2009.

For the determination of the cyanamide nitrogen content in fertilizers containing various forms, use EN 15604:2009.

For the determination of the total nitrogen content in calcium cyanamide, nitrate free, use EN 15560:2009.

For the determination of the total nitrogen content in calcium cyanamide, containing nitrates, use EN 15561:2009.

5.7 Methylene-urea and urea formaldehyde nitrogen content

For the determination of the methylene-urea and urea formaldehyde nitrogen content use EN 15478:2009.

5.8 P₂O₅ content

For the extraction of the total P₂O₅ content (in mineral acid), use EN 15956:2011.

For the extraction of the water-soluble P₂O₅ content use EN 15958:2011.

For the extraction of the neutral ammonium citrate soluble P₂O₅ content use EN 15957:2011.

For the determination of the extracted P₂O₅ use EN 15959:2011.

5.9 K₂O content

For the determination of the water-soluble K₂O content use EN 15477:2009.

5.10 MgO content

For the extraction of the total MgO content use EN 15960:2011.

For the extraction of the water-soluble MgO content use EN 15961:2017.

For the determination of the total MgO content and the water-soluble MgO content in fertilizers, use EN 16197:2012 or EN 16198:2012 depending on availability of the technique.