

Fertilizers - Determination of perchlorate in mineral fertilizers by liquid chromatography and tandem mass spectrometry detection (LC-MS/MS)

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN 17411:2020 sisaldab Euroopa standardi EN 17411:2020 ingliskeelset teksti.	This Estonian standard EVS-EN 17411:2020 consists of the English text of the European standard EN 17411:2020.
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English Version

## Fertilizers - Determination of perchlorate in mineral fertilizers by liquid chromatography and tandem mass spectrometry detection (LC-MS/MS)

Engrais - Dosage du perchlorate dans les engrais minéraux par chromatographie liquide couplée à la spectrométrie de masse (LC-MS/MS)

Düngemittel - Bestimmung von Perchlorat in mineralischen Düngemitteln - Bestimmung mittels Flüssig-Chromatographie und Tandem-Massenspektrometrischer Detektion (LC-MS/MS)

This European Standard was approved by CEN on 4 October 2020.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## European foreword

This document (EN 17411:2020) has been prepared by Technical Committee CEN/TC 260 “Fertilizers and liming materials”, the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2021, and conflicting national standards shall be withdrawn at the latest by May 2021.

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## 1 Scope

This document specifies a method for the determination of traces of perchlorate by liquid chromatography and tandem mass spectrometry detection (LC-MS/MS). The method is applicable to mineral fertilizers.

## 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 1482-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

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

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

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12944-1 and EN 12944-2 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 <https://www.iso.org/obp>

## 4 Principle

The perchlorate content of the fertilizer sample is determined by liquid chromatography with tandem mass spectrometry detection after water extraction. The sample is dissolved, filtered and directly analysed by LC-MS/MS. Quantification is performed using matrix calibration curve.

## 5 Reagents

Use only reagents of recognized analytical grade.

**5.1 Water**, grade 3 according to EN ISO 3696.

**5.2 Blank solution**, free of perchlorate similar to the samples.

Weigh 5 g of potassium nitrate in 250 ml eluent (5.4).

**5.3 Perchlorate standard stock solutions**,  $\rho(\text{ClO}_4^-) = 1 \text{ mg/l}$  and  $10 \text{ mg/l}$ .

Prepare the standard stock solutions using commercially available standard stock solutions.

**5.4 Eluent**, used for LC-MS/MS (mobile phase).