





TECHNICAL SPECIFICATION  
SPÉCIFICATION TECHNIQUE  
TECHNISCHE SPEZIFIKATION

**CEN/TS 17767**

April 2022

ICS 65.080

English Version

**Organo-mineral fertilizers - Extraction of phosphorus by  
formic acid**

Engrais organo-minéraux - Extraction du phosphore  
par l'acide formique

Organisch-mineralische Düngemittel - Extraktion von  
Phosphor durch Ameisensäure

This Technical Specification (CEN/TS) was approved by CEN on 13 March 2022 for provisional application.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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## European foreword

This document (CEN/TS 17767:2022) has been prepared by Technical Committee CEN/TC 260 “Fertilizers and liming materials”, the secretariat of which is held by DIN.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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## CEN/TS 17767:2022 (E)

### 1 Scope

This document specifies the procedure for the extraction of phosphorus in 2 % formic acid (20 g/l), representing the amount of soft natural phosphates.

The method is applicable to organo-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.

CEN/TS 17774, *Organic and organo-mineral fertilizers — Determination of the content of specific elements by ICP-AES after extraction by water*

### 3 Terms and definitions

No terms and definitions are listed in this document.

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

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

### 4 Principle

To differentiate between hard natural phosphates and soft natural phosphates, phosphorus soluble in formic acid is extracted from the test portion with a 2 % formic acid solution under specified conditions.

### 5 Sampling

Sampling should be performed carefully, following the principles described in EN 1482 (all parts) with appropriate adaptations, required to account for specificities of organic and organo-mineral fertilizers.

### 6 Reagents

- 6.1 **Water**, distilled or demineralized.
- 6.2 **Formic acid 2 %**, (concentration of 20 g/l).

Make 82 ml of formic acid (concentration 98 % to 100 %; density at 20 °C  $\rho_{20} = 1,22$  g/ml) up to 5 l with distilled water.

### 7 Apparatus

- 7.1 **Common laboratory equipment and glassware.**
- 7.2 **500 ml graduated flask**, with a wide neck (e.g. Stohmann).
- 7.3 **Rotary shaker**, 35 turns to 40 turns per min.

**7.4 Dry pleated filter**, free from phosphates.

## 8 Procedure

### 8.1 Test portion

Weigh, to the nearest 0,001 g, 5 g of the laboratory sample and place it in a dry 500 ml graduated flask (7.2).

### 8.2 Extraction

While continuously rotating the flask by hand, add formic acid (6.2) to the test portion at  $(20 \pm 1)$  °C until it is approximately 1 cm below the graduation mark and make up to the volume with formic acid (6.2). Close the flask with a rubber stopper and shake for 30 min at  $(20 \pm 2)$  °C on a rotary shaker (7.3).

Filter the solution through a dry pleated filter (7.4) into a dry glass receptacle. Discard the first portion of the filtrate. Continue the filtering until a sufficient quantity of filtrate is obtained to carry out the phosphorus determination. The determination of phosphorous after extraction shall be done according to CEN/TS 17774.

The extracts can be kept at  $(4 \pm 2)$  °C for maximum two days before determination.

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