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## Fertilizers, liming materials and inhibitors - Sampling and sample preparation - Part 1: General sampling provisions

Engrais, amendements minéraux basiques et inhibiteurs - Échantillonnage et préparation de l'échantillon - Partie 1 : Dispositions générales pour l'échantillonnage

Düngemittel, Kalkdünger und Hemmstoffe - Probenahme und Probenvorbereitung - Teil 1: Allgemeine Festlegungen zur Probenahme

This European Standard was approved by CEN on 25 November 2024.

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## European foreword

This document (EN 1482-1:2024) 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of an identical text or by endorsement, at the latest by June 2025, and conflicting national standards shall be withdrawn at the latest by June 2025.

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.

This document supersedes EN 1482-1:2007.

EN 1482-1 includes the following significant technical changes with respect to EN 1482-1:2007:

- Title, Introduction, Scope, Normative References, Terms and definitions have been updated;
- Requirements on sampling for detonation testing, oil retention and other tests added to 4.3.2;
- The mass of the final sample in 4.3.4 has been specified;
- 5.11 has been modified to improve sampling procedures.

EN 1482, *Fertilizers, liming materials and inhibitors — Sampling and sample preparation* consists of four parts:

- Part 1: General sampling provisions;
- Part 2: General sample preparation provisions;
- Part 3: Sampling of static heaps;
- Part 4: Sampling for microbiological presence in fertilizers.

This document has been prepared under a standardization request addressed to CEN by the European Commission. The Standing Committee of the EFTA States subsequently approves these requests for its Member States.

Any feedback and questions on this document should be directed to the users’ national standards body. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

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### Introduction

This document covers the following aspects of sampling, derived from the International Standards and documents indicated but presented in a simplified and condensed form. The titles of the International Standards are given in the Bibliography.

- Sampling plans and quantitative data: ISO 8634, ISO/TR 5307, ISO/TR 7553 and Regulation (EU) 2019/1009;
- Sampling methods: ISO 3963;
- Reduction: ISO 7410, ISO 7742, ISO 8358;
- Sampling reports: ISO 5306.

EN 1482-2 covers the general methods for the reduction and preparation of samples of fertilizers, liming materials and inhibitors for analysis. EN 1482-3 covers the sampling of specified products when stored in a static heap. EN 1482-4 covers the sampling of specified fertilizers to be tested for the presence of regulated microbes.

Figure 1 gives a schematic diagram of the sampling and sample preparation process for solids.

The fundamental principle of representative sampling is that every particle has an equal chance of being selected or rejected. In some circumstances this principle cannot easily be complied with, particularly in the case of bulk heaps of solid products not specified in EN 1482-3, or large storage tanks of liquid products as the majority of the product cannot be reached by any sampling device. The fertilizers, liming materials or inhibitors in these cases are sampled during transfer, during the building up of the heap, during the filling of the storage tank, during dispatch or where it is being moved solely for sampling purposes.

Document Preview

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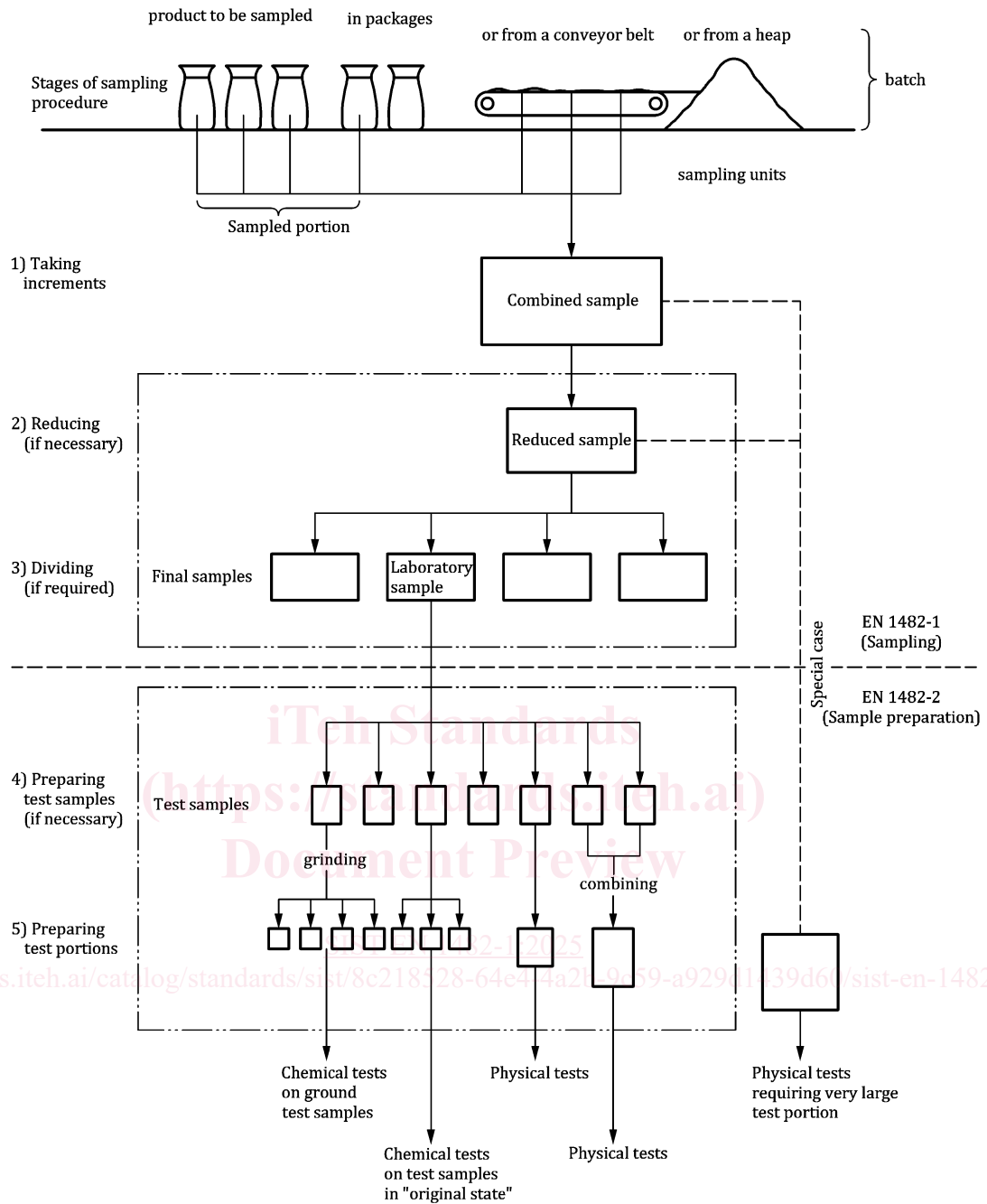


Figure 1 — Schematic diagram of sampling process for solids for chemical and physical testing

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### 1 Scope

This document specifies sampling plans and methods of representative sampling of fertilizers, liming materials and inhibitors, in liquid and solid form, for physical and chemical analysis. This document covers sampling of products in bulk only while in motion and from packages and containers up to and including 1 000 kg of product in solid form and 1 000 l of product in liquid form.

NOTE 1 The sampling of bulk heaps of specified types of fertilizers and liming materials is covered in EN 1482-3. Sampling for detection of microbial presence is covered by EN 1482-4.

NOTE 2 The term product is used throughout the body of this document and is understood to include fertilizers, liming materials and inhibitors unless otherwise indicated.

It is applicable to the sampling of batches of fertilizers, liming materials and inhibitors supplied or ready for supply to third parties, as such, or in smaller batches, each of which would be subject to local, national or regional legislation.

This document does not cover complete, statistical sampling plans.

This document is applicable to the fertilizing products blends where a blend is a mix of at least two of the following components: fertilizers, liming materials, soil improvers, growing media, inhibitors and plant biostimulants and where the following category organic fertilizers, organo-mineral fertilizers, inorganic fertilizers, liming materials or inhibitors is the highest % in the fertilizing product blend by mass or volume, or in the case of liquid form by dry mass. If the category (organic fertilizers, organo-mineral fertilizers, inorganic fertilizers, liming materials or inhibitors) is not the highest % in the fertilizing product blend, the European Standard for the highest % of the fertilizing product blend applies. In case a fertilizing product blend is composed of components in equal quantity, the user decides which standard to apply. Special care is needed to ensure that the fertilizing product blend is and stays homogeneous and well mixed when sampled.

NOTE 3 It is the responsibility of manufacturers, importers and sellers, however, to ensure they supply a product that complies with its label declaration at the moment of delivery and fulfils the expectations of the end user at the moment of application.

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### 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 1235, *Solid fertilizers — Test sieving (ISO 8397:1988 modified)*

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

ISO 2602, *Statistical interpretation of test results — Estimation of the mean — Confidence interval*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

### 3 Terms and definitions

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

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

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

#### 3.1

##### **batch**

total quantity of product present assumed to have the same characteristics

Note 1 to entry: A batch is produced by the same process at the same time, under the same conditions and labelled in the same manner, and assumed to have the same characteristics to be sampled using a particular sampling plan.

#### 3.2

##### **sampled portion**

<sampling for chemical and physical testing> quantity of product from the same batch from which one representative combined sample is taken

Note 1 to entry: In some instances, the batch and the sampled portion will be the same.

#### 3.3

##### **sampling unit**

defined quantity of product having a boundary, which can be physical or hypothetical

Note 1 to entry: An example of a physical boundary is a container. An example of a hypothetical boundary is a time interval for a flow of product.

#### 3.4

##### **incremental sample**

quantity of product taken from a sampling point

#### 3.5

##### **combined sample**

combination of all incremental samples taken from one sampled portion

#### 3.6

##### **reduction**

process of producing a representative smaller mass of product from a larger mass, with the remainder being discarded

#### 3.7

##### **reduced sample**

representative part of the combined sample obtained by a process of reduction in such a manner that the mass is at least the mass of the required final samples

#### 3.8

##### **division**

process of producing a number of representative smaller portions, approximately equal in mass to each other, from a larger mass

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### 3.9

#### **final sample**

<chemical and physical testing> representative part of the combined sample taken from the sampled portion obtained, where necessary, by a process of reduction

### 3.10

#### **delivery**

quantity of product transferred at one time

### 3.11

#### **laboratory sample**

<chemical and physical testing> final sample intended for laboratory testing

### 3.12

#### **ammonium nitrate fertilizer of high nitrogen content**

straight or compound solid inorganic macronutrient fertilizer, which is ammonium nitrate-based and contains 28 % or more by mass of nitrogen (N) as a result of ammonium nitrate

## 4 Sampling plans and quantitative data

### 4.1 General

Correct sampling is a difficult operation which requires great care. The need to obtain a fully representative sample for both the chemical and physical testing of products cannot be stressed too much. Sampling plans have been produced to cover a range of quantities of product and these form the basis of International Standards (see Bibliography).

The sampling plans given in this document are not based on strict statistical principles but samples obtained by following the procedures described in this clause shall be considered to be representative of the original batch or sampled portion.

This clause specifies sampling plans for the evaluation of deliveries of products as well as statutory control plans which shall be followed in certain circumstances.

For the commercial evaluation of a large delivery which is supplied for resale in smaller batches a number of samples representing parts of the delivery are required in order to assess the variability of the batch.

For example, a delivery of 5 000 t shall be treated as at least five deliveries of 1 000 t each and a separate final sample shall be collected and prepared from each. The determination in this document is based on a simple relationship between the amount to be sampled and the minimum number of incremental samples to be taken.

The methods of sampling to be used are described in Clause 5.

### 4.2 Sampling plans

#### 4.2.1 Determination of the number of sampling units which form the sampled portion

##### 4.2.1.1 General

The number of sampling units from which incremental samples shall be taken depends on the size of the batch.

#### 4.2.1.2 Product in packages or containers

In the case of product in packages or containers, the sampling unit is a package. The minimum number of individual packages from which incremental samples shall be taken is given in Table 1. In this context a package is normally taken to hold no more than 50 kg – larger containers such as Intermediate Bulk Containers (IBCs) are treated according to the procedure in 5.9 or 5.10. For packages weighing less than 1 kg each, it might be necessary to increase the number of packages to ensure a sufficiently large combined sample.

**Table 1 — Minimum number of individual packages (sampling units) from which incremental samples shall be taken**

Batch size	Minimum number of sampling units
4 or fewer packages	All packages
More than 4 and up to 10 packages	4
More than 10 and up to 400 packages	The nearest whole number above the square root of the number of packages present.
More than 400 packages	20

#### 4.2.1.3 Product in bulk

In the case of product in bulk, the minimum number of sampling units from which incremental samples shall be taken depends on the total mass present. The minimum number of sampling units to be sampled shall be in accordance with Table 2.

**Table 2 — Minimum number of sampling units from which incremental samples shall be taken**

Batch size	Minimum number of sampling units
25 t or less	10
More than 25 t and up to 400 t	The nearest whole number above the square root of 4 times the number of tonnes present.
More than 400 t	40

#### 4.2.2 Identification of the sampling units to be sampled

##### 4.2.2.1 Solid and liquid product in packages or containers

Identify the packages in the batch or sampled portion consecutively and, by using a source of random numbers, select the packages from which incremental samples shall be taken and mark them.

##### 4.2.2.2 Solid and liquid product in bulk during movement

Where the movement relates to loading or unloading using grabbing equipment such as a crane or automatic shovel loader, the sampling unit is the quantity of product corresponding to one grab. If the movement is a continuous operation such as on a conveyor belt or through a pipe, each sampling unit is made up of a mass of no more than 5 t.

Calculate the number of sampling units present from the total mass and, by using a source of random numbers, select the sampling units from which incremental samples shall be taken during the movement. Number the sampling units in chronological order of their formation.

Estimate the time taken for the product to pass the sampling place. Divide this time into equal time intervals such that the number of intervals is at least twice the minimum number of sampling units to be sampled in accordance with Table 2 and each sampling unit is not more than 5 t. The time intervals are

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the sampling units. From these sampling units randomly select the number from which incremental samples shall be taken. Within each of the selected sampling units randomly select a time at which the incremental sample is to be taken.

As there will be some variation in the speed of the belt or the flow in the pipe and the quantity at any one point, it is recommended that the number of sampling units selected is at least 10 % more than the minimum in Table 2.

Automatic mechanical samplers normally work at fixed time intervals. In this case the incremental samples are collected over the whole timescale and cannot be regarded as having been taken randomly. For formal sampling purposes the mechanical sampler shall be operated at the selected random times.

**4.2.3 Collection of incremental samples****4.2.3.1 General**

All incremental samples shall be of approximately the same mass or the same volume.

**4.2.3.2 Solid product in packages or containers up to and including 50 kg**

Take one incremental sample from each of the selected packages (sampling units 4.2.2.1), by the use of a divider (5.6 or 5.7) or by the manual method described in 5.8.

**4.2.3.3 Product in intermediate bulk containers**

Collect the relevant number of incremental samples by using the method described in 5.9 and/or 5.10.

**4.2.3.4 Solid product in bulk**

Collect the relevant number of incremental samples by using one of the methods described in 5.2 to 5.5.

**4.2.3.5 Liquid products**

Follow the appropriate procedure described in 5.11.

**4.3 Quantitative data****4.3.1 Mass of incremental samples**

Incremental samples shall be of at least 250 g each. For blended fertilizers and for liming materials coarser than 80 % passing 0,315 mm the minimum mass of each incremental sample shall be 500 g. For packages weighing 4 kg or less, the entire contents are taken as the incremental sample.

**4.3.2 Mass of single combined samples**

Combine and mix all the collected incremental samples. When necessary, reduce the combined sample as described in Clause 6, so that the final mass for chemical testing is at least 2 kg and for physical testing at least 4 times the maximum amount required for the physical test method.

When sampling ammonium nitrate fertilizers of high nitrogen content for testing for detonation resistance, the minimum quantity shall be 75 kg.

When sampling ammonium nitrate fertilizers of high nitrogen content for oil retention and other tests, the minimum quantity shall be 4 kg.

**4.3.3 Mass of multiple combined samples**

Combine and mix all the collected incremental samples for one sample before reduction to final samples. Each final sample shall have at least a mass equal to 4 times the maximum amount required for testing. Repeat this procedure for each final sample.