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## Fertilizers and soil conditioners — Compound fertilizer — General requirements

*Engrais et amendements — Engrais composé — Exigences générales*

ICS: 65.080

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## 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)).

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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 134, *Fertilizers, soil conditioners and beneficial substances*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## Introduction

Compound fertilizers are the fertilizers having a declarable content of the two or more primary plant nutrients (nitrogen and/or phosphorus and/or potassium), obtained chemically or by blending, or both. Since the 1930s, the increase of crop yield has relied heavily on the amount of fertilizer usage and the development of fertilizer industry.

Compound fertilizers attracted more and more attention since it can enhance the efficiency of fertilizer, simplify the fertilization procedure, and reduce the frequency of fertilization. Since the 1980s, compound fertilizers have been widely used.

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# Fertilizers and soil conditioners — Compound fertilizer — General requirements

## 1 Scope

This document specifies general requirements for testing methods, sampling and preparation of test sample, marking and labelling as well as package, transport and storage of compound fertilizers.

This document is applicable to inorganic solid compound fertilizers. Controlled-release compound fertilizer should also follow the relevant international standard.

## 2 Normative references

The following referenced 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 760, *Determination of water — Karl Fischer method (General method)*

ISO 5314, *Fertilizers — Determination of ammoniacal nitrogen content — Titrimetric method after distillation*

ISO 5315, *Fertilizers — Determination of total nitrogen content — Titrimetric method after distillation*

ISO 5317, *Fertilizers — Determination of water-soluble potassium content — Preparation of the test solution*

ISO 6598, *Fertilizers — Determination of phosphorus content — Quinoline phosphomolybdate gravimetric method*

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

ISO 8157, *Fertilizers and soil conditioners — Vocabulary*

ISO 8397, *Solid fertilizers and soil conditioners — Test sieving*

ISO 14820-1, *Fertilizers and liming materials — Sampling and sample preparation — Part 1: Sampling*

ISO 14820-2, *Fertilizers and liming materials — Sampling and sample preparation — Part 2: Sample preparation*

ISO 15604, *Fertilizers — Determination of different forms of nitrogen in the same sample, containing nitrogen as nitric, ammoniacal, urea and cyanamide nitrogen*

ISO 15959, *Fertilizers — Determination of extracted phosphorus*

ISO 17318, *Fertilizers and soil conditioners — Determination of arsenic, cadmium, chromium, lead and mercury contents*

ISO 17319, *Fertilizers and soil conditioners — Determination of water-soluble potassium content — Potassium tetraphenylborate gravimetric method*

ISO/DIS 19745, *Fertilizers and soil conditioners -- Determination of crude (free) water content of ammoniated phosphate products -- DAP, MAP -- by gravimetric vacuum oven at 50 °C*

ISO/DIS 20620, *Fertilizers and soil conditioners — Determination of total nitrogen by combustion*

ISO 22018, *Fertilizers, soil conditioners and beneficial substances — Determination of EDTA soluble phosphorus content in inorganic fertilizers*

ISO 25475, *Fertilizers — Determination of ammoniacal nitrogen*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8157 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>

#### 3.1 compound fertilizer

fertilizer having a declarable content of at least two of the primary plant nutrients (nitrogen, phosphorus, and potassium), obtained chemically or by blending, or both, including NP, NK, PK, and NPK product

[SOURCE: ISO 8157:2015, 2.2.7.1]

#### 3.2 complex fertilizer

compound fertilizer, obtained by chemical reaction, having a declarable content of at least two of the primary nutrients, including NP, NK, PK, and NPK product

[SOURCE: ISO 8157:2015, 2.2.7.2]

#### 3.3 blend fertilizer

fertilizer obtained by dry or liquid mixing of several components, with no chemical reaction

[SOURCE: ISO 8157:2015, 2.2.7.3]

#### 3.4 primary nutrient (element)

elements nitrogen, phosphorus, and potassium only

Note 1 to entry: Macronutrient is also used. These include the following plant food: nitrogen (N), available phosphate ( $P_2O_5$ ), and soluble potash ( $K_2O$ ).

Note 2 to entry: The following definition is recognized by some specific countries/regions: macro nutrient is the sum of primary and secondary nutrients, such as N, P, K, and Mg, Ca, as well as S (Na, Si).

[SOURCE: ISO 8157:2015, 2.1.3.1]

#### 3.5 secondary nutrient (element)

elements calcium, magnesium, and sulfur

Note 1 to entry: Sodium (Na) is one of the secondary nutrients (elements) in some countries/regions.

[SOURCE: ISO 8157:2015, 2.1.3.2]



**3.6****micronutrient ; trace element**

element, such as boron, manganese, iron, zinc, copper, molybdenum, cobalt, and/or chlorine, which are essential, in relatively small quantities, for plant growth

Note 1 to entry: Nickel (Ni) is also called a micronutrient (element) in some countries/regions, while in Japan, nickel is classified as harmful element.

[SOURCE: ISO 8157:2015, 2.1.3.3]

**3.7****total primary nutrient**

sum of total nitrogen, available phosphorus ( $P_2O_5$ ), and water-soluble potash ( $K_2O$ ) content, expressed as mass fraction in percent

[SOURCE: ISO 8157:2015, 2.1.36]

**3.8****available phosphorus**

sum of water soluble and citrated or EDTA-soluble phosphate, as based on regional or national regulation, or, in the absence of such regulations, sum of water soluble and citrated soluble phosphate or EDTA-soluble phosphate

**3.9****marking**

statement, symbol, logo, picture, and/or information, that is present on the label or package and identifies or implies a product and its quality, quantity, characteristic, usage, etc.

[SOURCE: ISO 8157:2015, 2.1.40] (standards.iteh.ai)

**3.10****label**

piece of paper or plastic, or a printed area of a package or container, marked with the necessary information to identify the product and make known its essential characteristics

[SOURCE: ISO 8157:2015, 2.1.59]

**3.11****primary nutrient formula**

term used in some countries to express, by numbers, in the order of  $N-P_2O_5-K_2O$ , the respective content of these nutrients in a compound fertilizer

Note 1 to entry: In some countries/regions, the mass fraction is expressed as the percentage of either element or oxide, in the order of nitrogen: phosphorus: potassium: secondary nutrients and micro-nutrients, the respective content of these nutrients in a compound fertilizer.

Note 2 to entry: A zero may be used to indicate the absence of an element.

[SOURCE: ISO 8157:2015, 2.1.37]