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Fertilizers and soil conditioners — Solid urea aldehyde slow release fertilizer — General requirements

Engrais et amendements — Engrais urée aldéhyde solide à libération lente — Exigences générales

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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).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on 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 the following URL: www.iso.org/iso/foreword.html.

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

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Introduction

Solid urea aldehyde slow release fertilizer is a non-coated and chemically synthesized nitrogen fertilizer with slow release effect. In 1924, the first slow release fertilizer patent in the world was issued to urea formaldehyde (UF) and in 1955, UF was put into commercial production as the oldest slow release fertilizer. Solid urea aldehyde slow release fertilizer has the longest history of research, use and production among the slow release fertilizers used in practice. At the same time, it is the most widely used of all slow release fertilizers.

For facilitating international fertilizer trade, it is necessary to have an international and general standard for solid urea aldehyde slow release fertilizers.

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Fertilizers and soil conditioners — Solid urea aldehyde slow release fertilizer — General requirements

1 Scope

This document specifies general requirements, analytical methods, sampling and preparation of test sample, marking and labelling, packaging, transport and storage for solid urea aldehyde slow release fertilizer.

This document applies to pure solid urea aldehyde slow release fertilizer, i.e. urea formaldehyde (UF), methylene urea (MU), crotonylidene diurea (CDU), isobutylidene diurea (IBDU). This document does not apply to mixtures of nitrogenous fertilizers containing solid urea aldehyde slow release fertilizer.

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.

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

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

ISO 7410, *Fertilizers and soil conditioners — Final samples — Practical arrangements*

ISO 7742, *Solid fertilizers — Reduction of samples*

ISO 8157, *Fertilizers and soil conditioners — Vocabulary*

ISO 8633, *Solid fertilizers — Simple sampling method for small lots*

ISO 19746:2017, *Determination of urea content in urea-based fertilizers by high performance liquid chromatography (HPLC)*

ISO 25705:2016, *Fertilizers — Determination of urea condensates using high-performance liquid chromatography (HPLC) — Isobutylidenediurea and crotonylidenediurea (method A) and methylen-urea oligomers (method B)*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8157 and the following 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
urea aldehyde slow release fertilizer
products of reaction between urea and aldehyde(s) that produce a slow release nitrogenous fertilizer

EXAMPLE Urea formaldehyde (UF), methylene urea (MU), crotonylidene diurea (CDU), isobutylidene diurea (IBDU).

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3.2
cold water insoluble nitrogen
CWIN
insoluble nitrogen fractions in urea formaldehyde or methylene urea products that are insoluble in phosphate buffer solution (pH 7,5) or distilled water at 25 °C during a 15 min period

3.3
cold water soluble nitrogen
CWSN
soluble nitrogen fractions in urea formaldehyde or methylene urea products that are soluble in phosphate buffer solution (pH 7,5) or distilled water at 25 °C during a 15 min period

Note 1 to entry: CWSN = Total nitrogen – CWIN

3.4
hot water insoluble nitrogen
HWIN
insoluble nitrogen fractions in urea formaldehyde or methylene urea products that are insoluble in phosphate buffer solution (pH 7,5) at 100 °C during a 30 min period

3.5
hot water soluble nitrogen
HWSN
soluble nitrogen fractions in urea formaldehyde or methylene urea products that are soluble in phosphate buffer solution (pH 7,5) at 100 °C during a 30 min period

Note 1 to entry: HWSN = Total nitrogen – HWIN

3.6
hot water soluble nitrogen only
HWSN only
soluble nitrogen fractions in urea formaldehyde or methylene urea products that are soluble in phosphate buffer solution (pH 7,5) at 100 °C during a 30 min period and insoluble in phosphate buffer solution (pH 7,5) at 25 °C during a 15 min period

Note 1 to entry: HWSN only = HWSN – CWSN = CWIN – HWIN

3.7
activity index
AI
percentage of *CWIN* (3.2) that is solubilised in hot water (*HWSN only*) (3.6)

Note 1 to entry: $\mathrm{AI} = \dfrac{\mathrm{CWIN} - \mathrm{HWIN}}{\mathrm{CWIN}} \times 100$

Note 2 to entry: CWIN and HWIN in Note 1 are expressed in the mass fraction (%).

Note 3 to entry: A higher AI indicates better slow release characteristics of urea formaldehyde fertilizer.

4 Requirements

4.1 Visual inspection

The product shall be in powder, granules, prills, pellets, pastilles, chips or other solid forms. Visually inspect for the presence of contaminant and foreign matter.

4.2 Requirement of solid urea aldehyde slow release fertilizer

Solid urea aldehyde slow release fertilizer shall be tested to demonstrate conformance with all the requirements specified in Tables 1 and 2 respectively, and declared values on containers.

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