

English Version

Fertilizers - Determination of cold water insoluble nitrogen and hot water insoluble nitrogen in solid urea formaldehyde and methylene urea slow-release fertilizers and determination of the solubility of nutrient polymers in phosphate buffer solution with a pH of 7,5 at 100 °C

Engrais - Dosage de l'azote insoluble dans l'eau froide et de l'azote insoluble dans l'eau chaude dans les engrais à libération lente urée-formaldéhyde solides et méthylène-urée, et détermination de la solubilité des polymères nutritifs dans une solution tampon phosphate avec un pH de 7,5 à 100 °C

Düngemittel - Bestimmung von kalt- und heißwasserunlöslichem Stickstoff in festen langsam freisetzenden Harnstoff-Formaldehyd- und Methylenharnstoff-Düngemitteln sowie Bestimmung der Löslichkeit von Nährstoffpolymeren in Phosphatpufferlösung mit einem pH-Wert von 7,5 bei 100 °C

This Technical Specification (CEN/TS) was approved by CEN on 30 November 2020 for provisional application.

The period of validity of this CEN/TS is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the CEN/TS can be converted into a European Standard.

CEN members are required to announce the existence of this CEN/TS in the same way as for an EN and to make the CEN/TS available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the CEN/TS) until the final decision about the possible conversion of the CEN/TS into an EN is reached.

CEN members are the national standards bodies of 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, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Sampling and sample preparation.....	7
4.1 Sampling of products in bags and in bulk	7
4.2 Reduction of samples.....	7
5 Determination of the mass fraction of CWIN.....	7
5.1 Principle	7
5.2 Reagents	7
5.3 Apparatus.....	7
5.4 Procedure.....	7
5.5 Calculation and expression of results.....	8
6 Determination of the mass fraction of HWIN	8
6.1 Principle	8
6.2 Reagents	8
6.3 Apparatus.....	8
6.4 Procedure.....	8
6.5 Calculation and expression of results.....	9
7 Determination of the solubility of nutrient polymers in phosphate buffer solution with a pH of 7,5 at 100 °C.....	9
8 Test report.....	9
Bibliography.....	11

European foreword

This document (CEN/TS 17403:2021) 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.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to announce this Technical Specification: 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, Turkey and the United Kingdom.

Introduction

Solid urea formaldehyde and methylene urea slow-release fertilizers are non-coated and chemically synthesized nitrogen fertilizers 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.

WARNING — Users of this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety issues, if any, associated with its use. It is the responsibility of the user to establish appropriate health and safety practices and to ensure compliance with any national regulatory conditions.

IMPORTANT — It is absolutely essential that tests conducted according to this document are carried out by suitably trained staff.

1 Scope

This document specifies a method for the determination of the cold and hot water insoluble nitrogen content in solid urea formaldehyde and methylene urea slow-release fertilizers and for the determination of the solubility of nutrient polymers in a phosphate buffer solution with a pH of 7,5 at 100 °C.

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*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12944-1 and EN 12944-2 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 formaldehyde

UF

slow-release nitrogenous fertilizer obtained by the reaction between urea and formaldehyde to produce molecular chains of general formula $\text{NH}_2\text{-CO-NH}(\text{CH}_2\text{NHCONH})_n\text{H}$

3.2

methylene urea

MU

slow-release nitrogenous fertilizer obtained by the reaction between urea and formaldehyde to produce oligomers such as MDU (methylenediurea), DMTU (dimethylentriurea), TMTU (trimethylentetraurea), TMPU (tetramethylenepentaurea) and higher counterparts

3.3

CMC 8 nutrient polymers

component material of EU fertilising products consisting of polymers exclusively made of monomer substances complying with the criteria set out in points 1 and 2 of CMC 1, where the purpose of the polymerisation is to control the release of nutrients from one or more of the monomer substances

Note 1 to entry: See [2], Annex II, Part I and Part II.