

<b>STN</b>	<b>Rastlinné biostimulátory</b> <b>Stanovenie <i>Azotobacter</i> spp.</b>	<b>STN</b> <b>EN 17709</b>  46 5610
------------	--	--

Plant biostimulants - Determination of *Azotobacter* spp.

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 02/25

Obsahuje: EN 17709:2024

Oznámením tejto normy sa ruší  
STN P CEN/TS 17709 (46 5610) z júla 2022

**139959**

---

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2025  
Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii  
v znení neskorších predpisov.



EUROPEAN STANDARD

EN 17709

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2024

ICS 65.080

Supersedes CEN/TS 17709:2022

English Version

## Plant biostimulants - Determination of *Azotobacter* spp.

Biostimulants des végétaux - Détermination  
d'*Azotobacter* spp.

Pflanzen-Biostimulanzien - Bestimmung von  
*Azotobacter* spp.

This European Standard was approved by CEN on 26 August 2024.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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, Türkiye 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**

## EN 17709:2024 (E)

<b>Contents</b>		Page
<b>European foreword</b> .....		3
<b>Introduction</b> .....		4
<b>1</b>	<b>Scope</b> .....	5
<b>2</b>	<b>Normative references</b> .....	5
<b>3</b>	<b>Terms and definitions</b> .....	5
<b>4</b>	<b>Enumeration of <i>Azotobacter</i> spp.</b> .....	5
<b>4.1</b>	<b>General</b> .....	5
<b>4.2</b>	<b>Sample preparation</b> .....	5
<b>4.2.1</b>	<b>General</b> .....	5
<b>4.2.2</b>	<b>Liquid – water-based formulations</b> .....	6
<b>4.2.3</b>	<b>Liquid – oil-based, emulsifiable concentrate (EC) formulations</b> .....	6
<b>4.2.4</b>	<b>Solid – wettable powder (WP) formulations</b> .....	6
<b>4.2.5</b>	<b>Solid – water-dispersible granules (WDG) formulations</b> .....	6
<b>4.2.6</b>	<b>Solid – pellets, granules, microgranules (slow release) formulations</b> .....	6
<b>4.2.7</b>	<b>Solid – substrate</b> .....	6
<b>4.3</b>	<b>Plate counts of <i>Azotobacter</i> spp. in sterile diluent with serial dilutions</b> .....	6
<b>4.4</b>	<b>Preparation of the culture media</b> .....	7
<b>4.5</b>	<b>Spread plate counting with Ashby’s Sucrose Agar [5] (for the different media, see Annex A)</b> .....	7
<b>4.6</b>	<b>Plate counts of <i>Azotobacter</i> spp. in sterile diluent</b> .....	8
<b>4.7</b>	<b>Calculation</b> .....	8
<b>5</b>	<b>Species determination of <i>Azotobacter</i> spp. via genetic analysis</b> .....	8
<b>5.1</b>	<b>General</b> .....	8
<b>5.2</b>	<b>Preparation of the sample for the genomic DNA extraction</b> .....	8
<b>5.2.1</b>	<b>Isolation and preparation of the microorganism</b> .....	8
<b>5.2.2</b>	<b>Sample concentration</b> .....	9
<b>5.2.3</b>	<b>DNA extraction and storage</b> .....	9
<b>5.2.4</b>	<b>Partial PCR amplification of the 16S rRNA genes</b> .....	9
<b>Annex A (normative) Composition and preparation of culture media and reagents</b> .....		11
<b>A.1</b>	<b>Ashby’s Sucrose Agar medium</b> .....	11
<b>A.2</b>	<b>Procedure for preparing nutrient broth medium</b> .....	12
<b>A.3</b>	<b>Procedure for preparing 0,1 M Phosphate Saline (PS)</b> .....	12
<b>A.4</b>	<b>Procedure for preparing 0,1 M Buffered peptone water</b> .....	12
<b>Annex B (informative) Repeatability and reproducibility of the method</b> .....		13
<b>B.1</b>	<b>Materials used in the interlaboratory comparison study</b> .....	13
<b>B.2</b>	<b>Interlaboratory comparison results</b> .....	14
<b>Annex ZA (informative) Relationship of this European Standard and the essential requirements of Regulation (EU) 2019/1009 available on the market of EU fertilising products aimed to be covered</b> .....		16
<b>Bibliography</b> .....		17

## European foreword

This document (EN 17709:2024) has been prepared by Technical Committee CEN/TC 455 “Plant biostimulants”, the secretariat of which is held by AFNOR.

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 May 2025, and conflicting national standards shall be withdrawn at the latest by May 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 CEN/TS 17709:2022.

EN 17709:2024 includes the following significant technical changes with respect to CEN/TS 17709:2022:

- the European foreword has been updated;
- the Introduction has been updated;
- in Annex A, buffered peptone water has been added as diluent for the enumeration;
- in 4.5, a general description of the colonies of the different genera has been included;
- the recipe of phosphate buffered saline has been modified;
- the Bibliography has been updated;
- Annex ZA has been added.

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.

For the relationship with EU Legislation, see informative Annex ZA, which is an integral part of this document.

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.

**EN 17709:2024 (E)****Introduction**

The European Committee for Standardization (CEN) was requested by the European Commission (EC) to draft European Standards or European Standardization deliverables to support the implementation of Regulation (EU) 2019/1009 of 5 June 2019 [1] laying down rules on the making available on the market of EU fertilising products (“FPR” or “Fertilising Products Regulation”).

This standardization request, presented as SR M/564 and relevant amendments, also contributes to the Communication on “Innovating for Sustainable Growth: A Bio economy for Europe”. The interest in plant biostimulants has increased significantly in Europe as a valuable tool to use in agriculture. Standardization was identified as having an important role in order to promote the use of biostimulants. The work of CEN/TC 455 seeks to improve the reliability of the supply chain, thereby improving the confidence of farmers, industry, and consumers in biostimulants, and will promote and support commercialisation of the European biostimulant industry.

## 1 Scope

This document was developed to provide the methodology for the enumeration and determination of *Azotobacter* spp. [2] [3] in microbial plant biostimulants in accordance with the Regulation (EU) 2019/1009 of the European Parliament and of the Council [1].

This document is applicable to the blends of fertilizing products where a blend is a mix of at least two of the following component EU fertilising products categories: Fertilizers, Liming Materials, Soil Improvers, Growing Media, Plant Biostimulants and where the following category Plant Biostimulants is the highest % in the blend by mass or volume, or in the case of liquid form by dry mass. If Plant Biostimulants is not the highest % in the blend, the European Standard for the highest % of the blend applies. In case a blend of fertilizing products is composed of components in equal quantity or in case the component EU fertilising products used for the blend have identical formulations<sup>1</sup>, the user decides which standard to apply.

## 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 17702-1:2024, *Plant biostimulants — Sampling and sample preparation — Part 1: Sampling*

EN 17724:2024, *Plant biostimulants — Terminology*

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**

---

<sup>1</sup> An example of such a blend is a product with 2 claimed functions consisting of a non-microbial plant biostimulant and an organic fertilizer composed of 1kg/kg of plant biostimulant from seaweed.