

<b>STN</b>	<b>Rastlinné biostimulátory Stanovenie šesťmocného chrómu (VI)</b>	<b>STN EN 17703</b>  46 5604
------------	--	--

Plant biostimulants - Determination of chromium(VI)

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 17703:2024

Oznámením tejto normy sa ruší  
STN P CEN/TS 17703 (46 5604) z júla 2022

**140016**



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 17703**

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2024

ICS 65.080

Supersedes CEN/TS 17703:2022

English Version

**Plant biostimulants - Determination of chromium(VI)**

Biostimulants des végétaux - Dosage du chrome(VI)

Pflanzen-Biostimulanzien - Bestimmung von  
Chrom(VI)

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 17703:2024 (E)

<b>Contents</b>		<b>Page</b>
<b>European foreword</b> .....		<b>3</b>
<b>Introduction</b> .....		<b>3</b>
<b>1</b>	<b>Scope</b> .....	<b>6</b>
<b>2</b>	<b>Normative references</b> .....	<b>6</b>
<b>3</b>	<b>Terms and definitions</b> .....	<b>6</b>
<b>4</b>	<b>Principle</b> .....	<b>7</b>
<b>5</b>	<b>Chemicals</b> .....	<b>7</b>
<b>6</b>	<b>Apparatus and materials</b> .....	<b>8</b>
<b>7</b>	<b>Procedure</b> .....	<b>9</b>
<b>7.1</b>	<b>Sampling and preparation of samples</b> .....	<b>9</b>
<b>7.2</b>	<b>Preparation of analytical solution</b> .....	<b>9</b>
<b>7.3</b>	<b>Chromatographic conditions</b> .....	<b>9</b>
<b>7.4</b>	<b>Calibration</b> .....	<b>9</b>
<b>7.5</b>	<b>Determination of the recovery rate</b> .....	<b>10</b>
<b>8</b>	<b>Calculation and expression of results</b> .....	<b>11</b>
<b>8.1</b>	<b>Calculation of chromium(VI) content</b> .....	<b>11</b>
<b>8.2</b>	<b>Recovery rate (according to 7.5)</b> .....	<b>11</b>
<b>8.3</b>	<b>Expression of results</b> .....	<b>12</b>
<b>9</b>	<b>Test report</b> .....	<b>12</b>
<b>Annex A (informative) Results of the inter-laboratory study</b> .....		<b>13</b>
<b>A.1</b>	<b>Inter-laboratory tests</b> .....	<b>13</b>
<b>A.2</b>	<b>Statistical results for the determination of Cr(VI)</b> .....	<b>13</b>
<b>Annex B (informative) Chromatographic conditions for direct detection method</b> .....		<b>15</b>
<b>B.1</b>	<b>General</b> .....	<b>15</b>
<b>B.2</b>	<b>Example of ion chromatographic conditions</b> .....	<b>15</b>
<b>B.2.1</b>	<b>Mobile phase reagents</b> .....	<b>15</b>
<b>B.2.2</b>	<b>Instrumental conditions</b> .....	<b>15</b>
<b>Annex C (informative) Chromatographic conditions for method with post-column reaction</b> .....		<b>17</b>
<b>C.1</b>	<b>General</b> .....	<b>17</b>
<b>C.2</b>	<b>Chromatographic system and apparatus required</b> .....	<b>17</b>
<b>C.3</b>	<b>Example of analytical conditions</b> .....	<b>18</b>
<b>Annex ZA (informative) Relationship of this European Standard and the essential requirements of Regulation (EU) 2019/1009 making available on the market of EU fertilising products aimed to be covered</b> .....		<b>21</b>
<b>Bibliography</b> .....		<b>22</b>

## European foreword

This document (EN 17703:2024) 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 17703:2022.

In comparison with the previous edition no significant technical changes were applied in this document.

The following main editorial changes have been made:

- In the Introduction, standards used as basis for the document and the description of Annexes A, B and C were added;
- In the Scope (Clause 1), the applicability of the document to blends was added;
- The Normative references (Clause 2) and the Bibliography were reordered. Clause 2 only contains the references that some or all of their content constitute requirements of this document, while the other references were included in the Bibliography;
- The principle (Clause 4) was better clarified;
- In Clause 8, the calculation and the expression of the results were aligned to EN 17704:2024 for the dry matter expression;
- In the test report (Clause 9) further information was added;
- Annex A on the results of the inter-laboratory study was added and consequently Annex A (Chromatographic conditions for direct detection method) and Annex B (Chromatographic conditions for method with post-column reaction) became Annex B and C respectively;
- In Annex B and Annex C, two examples of chromatograms were added;
- Annex ZA for the relationship with EU Legislation was added;
- In the text, if references were superseded, the latest edition has been mentioned.

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 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.

**EN 17703:2024 (E)**

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.

## 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.

This document provides the method for the chromium VI extraction and determination as mentioned in Annex I, Part II, PFC 6, item 2(b) of Regulation (EU) 2019/1009 [1].

Standards for determination of chromium VI in soil and waste [2] and for leather [3] were studied and considered as a basis of this document.

This document contains two annexes (B and C) which describe two possible ways for determining chromium VI by ion chromatography. Annex B describes an example of chromatographic conditions for the direct detection method, while Annex C explains the chromatographic conditions for method with post-column reaction. Both methods can be applied to determine Chromium VI. The choice depends on the equipment available in laboratories.

The inter-laboratory study reflects the final statistical characteristics of the method for the determination of chromium VI content in plant biostimulants. The results are given in Annex A (informative).

**WARNING** — Persons using this document should be familiar with usual 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.

**EN 17703:2024 (E)****1 Scope**

This document specifies a method for verifying that hexavalent chromium (Cr(VI)) is not present in plant biostimulants.

This document is applicable to all types of plant biostimulants (solid and liquid) used in agriculture.

The method specified is suitable to quantify the chromium(VI) content in plant biostimulants down to 2 mg/kg.

The results obtained from this method are strictly dependent on the extraction conditions. Results obtained by using other extraction procedures (extraction solution, pH, extraction time, etc.) are not comparable with the results produced by the procedure specified in this document.

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: Fertilizers, Liming Materials, Soil Improvers, Growing Media, Inhibitors, Plant Biostimulants and where the following category Plant Biostimulants is the highest percentage in the blend by mass or volume, or in the case of liquid form by dry mass. If Plant Biostimulants is not the highest percentage in the blend, the European Standard for the highest percentage 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 17702-2:2024 *Plant biostimulants — Sampling and sample preparation — Part 2: Sample preparation*

EN 17704:2024, *Plant biostimulants — Determination of dry matter*

**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 1 kg/kg of plant biostimulant from seaweed.