SLOVENSKI STANDARD
SIST EN 18196:2026

01-julij-2026

Alge in izdelki iz alg - Ugotavljanje anorganskega arzena v algah in izdelkih iz alg z anionsko izmenjavo (HPLC-ICP-MS)

Algae and algae products - Determination of inorganic arsenic in algae and algae products by anion-exchange (HPLC-ICP-MS)

Algen und Algenprodukte - Bestimmung von anorganischem Arsen in Algen und Algenprodukten durch Anionenaustausch (HPLC-ICP-MS)

Algues et produits d'algues - Détermination de l'arsenic inorganique dans les algues et les produits d'algues par échange d'anions et spectrométrie de masse à plasma à couplage inductif (CLHP/ICP-SM)

Ta slovenski standard je istoveten z: **EN 18196:2026**

ICS:

13.020.55	Biološki izdelki	Biobased products

SIST EN 18196:2026 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 18196

May 2026

ICS 13.020.55

English Version

Algae and algae products - Determination of inorganic arsenic in algae and algae products by anion-exchange (HPLC-ICP-MS)

Algues et produits d'algues - Détermination de l'arsenic inorganique dans les algues et les produits d'algues par échange d'anions et spectrométrie de masse à plasma à couplage inductif (CLHP/ICP-SM)

Algen und Algenprodukte - Bestimmung von anorganischem Arsen in Algen und Algenprodukten durch Anionenaustausch (HPLC-ICP-MS)

This European Standard was approved by CEN on 13 April 2026.

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

Ref. No. EN 18196:2026 E

Contents

Page

European foreword

This document (EN 18196:2026) has been prepared by Technical Committee CEN/TC 454 “Algae and algae products”, the secretariat of which is held by NEN.

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 November 2026, and conflicting national standards shall be withdrawn at the latest by November 2026.

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 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.

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.

Introduction

This document has been prepared by the experts of CEN/TC 454 'Algae and algae products'.

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 Article 3 of Directive 2009/28/EC for algae and algae-based products or intermediates.

This request, presented as Mandate M/547, also contributes to the Communication on “Innovating for Sustainable Growth: A Bio economy for Europe”.

The former working group CEN Technical Board Working Group 218 “Algae”, was created in 2016 to develop a work programme as part of this Mandate. The technical committee CEN/TC 454 'Algae and algae products' was established to carry out the work programme that will prepare a series of standards.

The interest in algae and algae-based products or intermediates has increased significantly in Europe as a valuable source including but not limited to, carbohydrates, proteins, lipids, and several pigments. These materials are suitable for use in a wide range of applications from food and feed purposes to other sectors, such as textile, cosmetics, biopolymers, biofuel and fertilizer/biostimulants. Standardization was identified as having an important role in order to promote the use of algae and algae products.

The work of CEN/TC 454 should improve the reliability of the supply chain, thereby improving the confidence of industry and consumers in algae, which include macroalgae, microalgae, cyanobacteria, Labyrinthulomycetes, algae-based products or intermediates and will promote and support commercialisation of the European algae industry.

This standard was developed with respect to standards EN 16802 [1], EN 17374 [2] and EN 17706 [3]. It shares the same extraction procedure with these standards. The detection procedure was modified by changing the isocratic elution condition into a gradient elution.

1 Scope

This document describes a method for the determination of inorganic arsenic in algae and algae products by anion-exchange HPLC-ICP-MS following water bath extraction. The method is specifically designed for seaweeds containing inorganic arsenic and arsenosugar 408 (i.e. sulfate-arsinoylriboside). The peaks of inorganic arsenic and arsenosugar 408 are separated by gradient elution.

The method was initially tested and evaluated on the algae species *Ascophyllum nodosum, Fucus vesiculosus* and *Saccharina latissima*. Given the limited number of participating laboratories in the interlaboratory studies, this document is only validated for *Ascophyllum nodosum* and *Saccharina latissima*, but it can also be used for other algae species.

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 17399, *Algae and algae products — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 17399 apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp/

— IEC Electropedia: available at https://www.electropedia.org/

4 Abbreviated terms

For the purposes of this document, the following abbreviated terms apply.

As(III)	Arsenite
As(V)	Arsenate
HPLC	High performance liquid chromatography
ICP-MS	Inductively coupled plasma mass spectrometry

5 Principle

Inorganic arsenic consists of As(III) and As(V). A representative test portion of the sample is treated with a diluted nitric acid and hydrogen peroxide solution in a heated water bath. Hereby the arsenic species are extracted into solution and As(III) is oxidized to As(V).

The inorganic arsenic is selectively separated from other arsenic compounds using anion exchange HPLC coupled online to the element-specific detector ICP-MS for the determination of the mass fraction of inorganic arsenic. External calibration with solvent matrix-matched standards is used for quantification of the amount of inorganic arsenic.