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| STN | Tuhé environmentálne matrice Stanovenie prvkov pomocou hmotnostnej spektrometrie s indukčne viazanou plazmou (ICP-MS) (ISO 16965: 2025) | STN EN ISO 16965 83 8432 |
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Environmental solid matrices - Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS) (ISO 16965:2025)

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. 12/25

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EN ISO 16965

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English Version

Environmental solid matrices - Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS) (ISO 16965:2025)

Matrices solides environnementales - Détermination des éléments par spectrométrie de masse avec plasma à couplage inductif (ICP (ISO 16965:2025))

Feststoffe in der Umwelt - Bestimmung von Elementen mittels Massenspektrometrie mit induktiv gekoppeltem Plasma (ICP-MS) (ISO 16965:2025)

This European Standard was approved by CEN on 22 September 2025.

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EN ISO 16965:2025 (E)

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European foreword

This document (EN ISO 16965:2025) has been prepared by Technical Committee ISO/TC 190 "Soil quality " in collaboration with Technical Committee CEN/TC 444 "Environmental characterization of solid matrices" 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of an identical text or by endorsement, at the latest by March 2026, and conflicting national standards shall be withdrawn at the latest by March 2026.

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Endorsement notice

The text of ISO 16965:2025 has been approved by CEN as EN ISO 16965:2025 without any modification.



International Standard

ISO 16965

Environmental solid matrices — Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS)

*Matrices solides environnementales — Détermination des
éléments par spectrométrie de masse avec plasma à couplage
inductif (ICP-MS)*

**First edition
2025-09**

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ISO 16965:2025(en)**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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For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 190, *Soil quality*, Subcommittee SC 3, *Chemical and physical characterization*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 444, *Environmental characterization of solid matrices*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 16965 cancels and replaces ISO/TS 16965:2013, which has been technically revised.

The main changes are as follows :

- the contents of ISO/TS 16965 and EN 16171 have been merged;
- the scope has been expanded to include treated biowaste, waste, sludge and sediment;
- performance data from an interlaboratory comparison has been added ([Annex A](#)).

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Environmental solid matrices — Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS)

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

IMPORTANT — Tests conducted according to this document shall be carried out by suitably trained staff.

1 Scope

This document specifies a method for the determination of the following elements in aqua regia, nitric acid or mixture of hydrochloric (HCl), nitric (HNO₃) and tetrafluoroboric (HBF₄)/hydrofluoric (HF) acid digests of soil, treated biowaste, waste, sludge and sediment:

aluminium (Al), antimony (Sb), arsenic (As), barium (Ba), beryllium (Be), bismuth (Bi), boron (B), cadmium (Cd), calcium (Ca), cerium (Ce), caesium (Cs), chromium (Cr), cobalt (Co), copper (Cu), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), gallium (Ga), germanium (Ge), gold (Au), hafnium (Hf), holmium (Ho), indium (In), iridium (Ir), iron (Fe), lanthanum (La), lead (Pb), lithium (Li), lutetium (Lu), magnesium (Mg), manganese (Mn), mercury (Hg), molybdenum (Mo), neodymium (Nd), nickel (Ni), palladium (Pd), phosphorus (P), platinum (Pt), potassium (K), praseodymium (Pr), rhenium (Re), rhodium (Rh), rubidium (Rb), ruthenium (Ru), samarium (Sm), scandium (Sc), selenium (Se), silicon (Si), silver (Ag), sodium (Na), strontium (Sr), sulfur (S), tellurium (Te), terbium (Tb), thallium (Tl), thorium (Th), thulium (Tm), tin (Sn), titanium (Ti), tungsten (W), uranium (U), vanadium (V), ytterbium (Yb), yttrium (Y), zinc (Zn), and zirconium (Zr).

NOTE 1 Details on validation are given in [Annex A](#).

This method is also applicable for the determination of major, minor and trace elements in aqua regia and nitric acid digests and in eluates of construction products (EN 17200[2]).

NOTE 2 Construction products include e.g. mineral-based products, bituminous products, metals, wood-based products, plastics and rubbers, sealants and adhesives, paints and coatings.

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 17294-1, *Water quality — Application of inductively coupled plasma mass spectrometry (ICP-MS) — Part 1: General requirements*

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