
**Zrak na delovnem mestu - Določanje anorganskih kislin z ionsko kromatografijo -
3. del: Fluorovodikova kislina in fluoridi (fluoridni delci)**

Workplace atmospheres - Determination of inorganic acids by ion chromatography - Part
3: Hydrofluoric acid and particulate fluorides

Air des lieux de travail - Détermination des acides inorganiques par chromatographie
ionique - Partie 3: Acide fluorhydrique et fluorures particuliers

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**International
Standard**

ISO 21438-3

**Workplace atmospheres —
Determination of inorganic acids by
ion chromatography —**

**Part 3:
Hydrofluoric acid and particulate
fluorides**

*Air des lieux de travail — Détermination des acides inorganiques
par chromatographie ionique —*

Partie 3: Acide fluorhydrique et fluorures particuliers

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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 document 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 146, *Air quality*, Subcommittee SC 2, *Workplace atmospheres*.

This second edition cancels and replaces the first edition (ISO 21438-3:2010), which has been technically revised.

The main changes are as follows:

- the normative references in [Clause 2](#) has been updated;
- terms that are also defined in ISO 18158 have been removed from [Clause 3](#);
- the reagents for electronically suppressed ion chromatography have been removed from [Clause 6](#);
- [Clause 8](#) has been reduced by referencing relevant standards;
- [Figure 1](#) has been added.

A list of all parts in the ISO 21438 series can be found on the ISO website.

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.

ISO 21438-3:2026(en)**Introduction**

The health of workers in many industries is at risk through exposure by inhalation of hydrofluoric acid and particulate fluorides. Industrial hygienists and other public health professionals need to determine the effectiveness of measures taken to control workers' exposure, and this is generally achieved by making workplace air measurements. This document provides a method for making valid exposure measurements for hydrofluoric acid and particulate fluorides in use in industry. It is intended for agencies concerned with health and safety at work; industrial hygienists and other public health professionals; analytical laboratories; industrial users of hydrofluoric acid and particulate fluorides, and their workers.

The execution of the provisions and the interpretation of the results obtained with the use of this document is entrusted to appropriately qualified and experienced people.

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Workplace atmospheres — Determination of inorganic acids by ion chromatography —

Part 3: Hydrofluoric acid and particulate fluorides

1 Scope

This document specifies a method for the determination of the time-weighted average mass concentration of soluble particulate fluorides and hydrofluoric acid (HF) in workplace air by collection of the particulate fluorides on a pre-filter and HF on an alkali-impregnated filter and analysis by ion chromatography.

This method is only applicable to determination of particulate fluorides that are soluble using the sample preparation procedure specified.

For aerosol sampling, this method is applicable to the personal sampling of the inhalable fraction of airborne particles, as defined in ISO 7708, and to static (area) sampling.

The method is applicable to the determination of masses of 0,005 mg to at least 1,25 mg of particulate fluorides per sample and 0,015 mg to at least 1,2 mg of HF per sample.

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 3696, *Water for analytical laboratory use — Specification and test methods*

ISO 7708, *Air quality — Particle size fraction definitions for health-related sampling*

ISO 8655-1, *Piston-operated volumetric apparatus — Part 1: Terminology, general requirements and user recommendations*

ISO 8655-2, *Piston-operated volumetric apparatus — Part 2: Pipettes*

ISO 8655-6, *Piston-operated volumetric apparatus — Part 6: Gravimetric reference measurement procedure for the determination of volume*

ISO 18158, *Workplace air — Terminology*

ISO 20581:2016, *Workplace air — General requirements for the performance of procedures for the measurement of chemical agents*

EN 13205, *Workplace atmospheres — Assessment of performance of instruments for measurement of airborne particles*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 18158 and the following apply.