



**SLOVENSKI STANDARD  
SIST EN ISO 4947:2020**

**01-oktober-2020**

**Nadomešča:  
SIST EN 24947:1998**

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**Jeklo in lito železo - Določevanje vanadija - Potenciometrijska metoda titracije (ISO 4947:2020)**

Steel and cast iron - Determination of vanadium content - Potentiometric titration method (ISO 4947:2020)

Stahl und Gusseisen - Bestimmung des Vanadium-Gehaltes - Potentiometrisches Titrierverfahren (ISO 4947:2020)

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Aciers et fontes - Dosage du vanadium - Méthode par titrage potentiométrique (ISO 4947:2020)

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**Ta slovenski standard je istoveten z: EN ISO 4947:2020**

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**ICS:**

77.080.01      Železne kovine na splošno      Ferrous metals in general

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EUROPEAN STANDARD

EN ISO 4947

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2020

ICS 77.080.01

Supersedes EN 24947:1991

English Version

## Steel and cast iron - Determination of vanadium content - Potentiometric titration method (ISO 4947:2020)

Acier et fonte - Détermination des teneurs en  
vanadium - Méthode par titrage potentiométrique (ISO  
4947:2020)

Stahl und Gusseisen - Bestimmung des Vanadium-  
Gehaltes - Potentiometrisches Titrierverfahren (ISO  
4947:2020)

This European Standard was approved by CEN on 9 May 2020.

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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.

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## European foreword

This document (EN ISO 4947:2020) has been prepared by Technical Committee ISO/TC 17 "Steel" in collaboration with Technical Committee CEN/TC 459/SC 2 "Methods of chemical analysis for iron and steel" the secretariat of which is held by SIS.

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of an identical text or by endorsement, at the latest by January 2021, and conflicting national standards shall be withdrawn at the latest by January 2021.

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.

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INTERNATIONAL  
STANDARD

ISO  
4947

Second edition  
2020-06

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**Steel and cast iron — Determination of  
vanadium content — Potentiometric  
titration method**

*Acier et fonte — Détermination des teneurs en vanadium — Méthode  
par titrage potentiométrique*

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CH-1214 Vernier, Geneva  
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## ISO 4947:2020(E)

### 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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

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](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 1, *Methods of determination of chemical composition*.

<https://standards.iteh.ai/catalog/standards/sist/0fb0c85c-5541-4c59-927d-191861818d18/iso-4947-2020>

This second edition cancels and replaces the first edition (ISO 4947:1986), which has been technically revised. The main changes compared to the previous edition are as follows:

- introduction of an optional electrode;
- re-assessment of precision data.

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](http://www.iso.org/members.html).

# Steel and cast iron — Determination of vanadium content — Potentiometric titration method

## 1 Scope

This document specifies a potentiometric titration method for the determination of vanadium in steel and cast iron.

The method is applicable to vanadium contents between 0,04 % (mass fraction) and 2 % (mass fraction).

## 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 385, *Laboratory glassware — Burettes*

ISO 648, *Laboratory glassware — Single-volume pipettes*

ISO 1042, *Laboratory glassware — One-mark volumetric flasks*

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

ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition*

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## 3 Terms and definitions

No terms and definitions are listed in this document.

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

- ISO Online browsing platform: available at <http://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

## 4 Principle

Dissolution of a test portion with appropriate acids. Addition of hydrofluoric acid to keep tungsten in solution.

Oxidation of chromium and vanadium by potassium peroxydisulfate. Partial oxidation of chromium.

While checking the potential of the solution:

- reduction of chromium(VI) and vanadium(V) by ammonium iron(II) sulfate;
- oxidation of vanadium by a slight excess of potassium permanganate; reduction of the excess of permanganate by sodium nitrite, and reduction of the excess of sodium nitrite by sulfamic acid.

Potentiometric titration of vanadium with an ammonium iron(II) sulfate standard solution.