SLOVENSKI STANDARD
SIST EN 10178:2024

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Jekla - Določevanje niobija - Spektrofotometrična metoda

Steels - Determination of niobium - Spectrophotometric method

Stähle - Bestimmung von Niob - Photometrisches Verfahren

Aciers - Détermination du niobium - Méthode spectrophotométrique

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Steels - Determination of niobium - Spectrophotometric method

Aciers - Détermination du niobium - Méthode spectrophotométrique

Stähle - Bestimmung von Niob - Photometrisches Verfahren

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European foreword

This document (EN 10178:2024) has been prepared by 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of an identical text or by endorsement, at the latest by December 2024, and conflicting national standards shall be withdrawn at the latest by December 2024.

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 EN 10178:1989.

In comparison with the previous edition, the following technical modifications have been made:

— normative references: updated;

— Clause 3 Terms and definitions: added;

— reference 5.13: added;

— reference 5.18: title simplified;

— Clause 6: developed and subclauses 6.1 and 6.2, added;

— Clause 7: updated;

— former subclause 7.3.3: included in 8.3.2;

— Clause 10: updated;

— Bibliography: added.

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.

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1 Scope

This document specifies a spectrophotometric method for the determination of niobium in steels.

The method is applicable to all grades of steels with niobium contents up to 1,3 % (by mass), with a lower limit of detection of 0,002 % (by mass).

The precision data of the present method are given in Annex A.

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

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

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

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

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 https://www.iso.org/obp

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

4 Principle

Dissolution of a test portion with hydrochloric acid followed by oxidation with hydrogen peroxide. Precipitation of niobium and tantalum with phenylarsonic acid using zirconium as a carrier.

Formation of a complex of niobium with 4-(2-pyridylazo)-resorcinol (PAR) in a buffered sodium tartrate medium.

Spectrophotometric measurement of the coloured compound at a wavelength of 550 nm.

5 Reagents

5.1 General

During analysis, unless otherwise stated, use only reagents of recognized analytical grade and only grade 2 water as specified in EN ISO 3696 or water of equivalent purity.

5.2 Iron, of high purity, free from niobium

5.3 Potassium hydrogen sulphate ($KHSO_4$)

5.4 Hydrochloric acid, ρ_{20} 1,19 g/ml approximately