



NSAI
Standards

Irish Standard
I.S. EN 10177:2019

Steels - Determination of calcium content
- Flame atomic absorption spectrometric
method (FAAS)

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I.S. EN 10177:2019

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National Foreword

I.S. EN 10177:2019 is the adopted Irish version of the European Document EN 10177:2019, Steels - Determination of calcium content - Flame atomic absorption spectrometric method (FAAS)

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EUROPEAN STANDARD

EN 10177

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2019

ICS 77.040.30

Supersedes EN 10177:1989

English Version

Steels - Determination of calcium content - Flame atomic absorption spectrometric method (FAAS)

Aciers - Détermination de la teneur en calcium -
Méthode par spectrométrie d'absorption atomique
dans la flamme (SAAF)

Stahl - Bestimmung des Calciumgehalt -
Flammenatomabsorptionsspektrometrisches
Verfahren (FAAS)

This European Standard was approved by CEN on 22 April 2019.

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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 10177:2019) has been prepared by Technical Committee CEN/TC 459 “ECISS - European Committee for Iron and Steel Standardization”¹, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by December 2019, and conflicting national standards shall be withdrawn at the latest by December 2019.

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 10177:1989.

In comparison with EN 10177:1989, the following significant technical changes were made:

- Clause 1: limits of the scope changed;
- Normative references: revised;
- Clause 4: possibility for using aqua regia for the dissolution and other suitable radiation sources added;
- Clause 5: preparation of iron base solution added;
- 8.3: details regarding the preparation of the test solution added
- 8.3.3: calibration solutions expanded;
- 8.3.5 and Clause 9: bracketing method for the spectrometric measurements added;
- Clause 10: editorially updated;
- Bibliography: added.

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, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

¹ Through its subcommittee SC 2 “Methods of chemical analysis for iron and steel” (secretariat: SIS)

1 Scope

This document specifies a flame atomic absorption spectrometric method (FAAS) for the determination of calcium content in non-alloy and low alloy steels.

The method is applicable to calcium contents between 4 µg/g and 120 µg/g.

The method can be adapted to higher calcium contents by changing the test portion or the dilution process, provided the criteria in 6.2.2 and 6.2.3 are still met.

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)*

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:

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

4 Principle

Dissolution of a test portion in hydrochloric acid followed by oxidation with nitric acid.

NOTE 1 Aqua regia can be used for simultaneous dissolution and oxidation of the test portion.

Addition of a solution of potassium chloride and nebulization of the test solution into an acetylene/nitrous oxide flame of an atomic absorption spectrometer.

NOTE 2 Potassium chloride is added to suppress ionization of calcium.

Spectrometric measurement of the atomic absorption of the 422,7 nm spectral line emitted by a calcium hollow-cathode lamp.

NOTE 3 Other suitable radiation sources can also be used, provided the criteria in 6.2.2 and 6.2.3 are still met.

5 Reagents

During the analysis, use only reagents of recognized analytical grade and only distilled water or water of equivalent purity.

The following concentrations and amounts can be modified, provided the changes are taken into account in 8.3 and Clause 9.

5.1 Pure iron.

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