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Standards

Irish Standard  
I.S. EN ISO 439:2020

# Steel and cast irons - Determination of silicon content - Gravimetric method (ISO 439:2020)

**I.S. EN ISO 439:2020**

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## National Foreword

I.S. EN ISO 439:2020 is the adopted Irish version of the European Document EN ISO 439:2020, Steel and cast irons - Determination of silicon content - Gravimetric method (ISO 439:2020)

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EUROPEAN STANDARD

EN ISO 439

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2020

ICS 77.080.01

Supersedes EN ISO 439:2010

English Version

## Steel and cast irons - Determination of silicon content - Gravimetric method (ISO 439:2020)

Aciers et fontes - Détermination de la teneur en  
silicium - Méthode gravimétrique (ISO 439:2020)

Stahl und Eisen - Bestimmung des  
Gesamtsiliziumgehaltes - Gravimetrisches Verfahren  
(ISO 439:2020)

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**EN ISO 439:2020 (E)**

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## **European foreword**

This document (EN ISO 439:2020) 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of an identical text or by endorsement, at the latest by August 2020, and conflicting national standards shall be withdrawn at the latest by August 2020.

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 ISO 439:2010.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## **Endorsement notice**

The text of ISO 439:2020 has been approved by CEN as EN ISO 439:2020 without any modification.

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# INTERNATIONAL STANDARD

**ISO  
439**

Third edition  
2020-02

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## **Steel and cast iron — Determination of silicon content — Gravimetric method**

*Aciers et fontes — Détermination des teneurs en silicium — Méthode  
gravimétrique*



Reference number  
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**ISO 439:2020(E)**



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## ISO 439:2020(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 on 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 the following URL: [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*.

This third edition cancels and replaces the second edition (ISO 439:1994), which has been technically revised. The main change compared to the previous edition is:

— a complete reevaluation of the 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 silicon content — Gravimetric method

## 1 Scope

This document specifies a gravimetric method for the determination of the silicon content in steel and cast iron.

The method is applicable to silicon contents between 0,10 % (mass fraction) and 5,0 % (mass fraction).

NOTE For samples containing molybdenum, niobium, tantalum, titanium, tungsten, zirconium or high levels of chromium, the results are less accurate than for unalloyed matrixes.

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition*

## 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 <http://www.electropedia.org/>

## 4 Principle

Dissolution of a test portion with hydrochloric and nitric acids.

Conversion of acid-soluble silicon compounds to hydrated silicon dioxide by evaporation with perchloric acid until white fumes appear. Filtration of the hydrated silicon dioxide and acid-insoluble silicon compounds, ignition to form impure silicon dioxide and then weighing.

Treatment of the ignited residue with hydrofluoric and sulfuric acids, followed by ignition and weighing.

## 5 Reagents

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

### 5.1 Hydrochloric acid, $\rho$ approximately 1,19 g/ml.

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