



SLOVENSKI STANDARD SIST EN ISO 15350:2010

01-julij-2010

Jeklo in železo - Določevanje celotnega ogljika in žvepla - Metoda z infrardečo absorpcijo po zgorevanju v indukcijski peči (rutinska metoda) (ISO 15350:2000)

Steel and iron - Determination of total carbon and sulfur content - Infrared absorption method after combustion in an induction furnace (routine method) (ISO 15350:2000)

Stahl und Eisen - Bestimmung der Gesamtgehalte an Kohlenstoff und Schwefel - Infrarotabsorptionsverfahren nach Verbrennung in einem Induktionsofen (Standardverfahren) (ISO 15350:2000)

Aciers et fontes - Dosage du carbone et du soufre totaux - Méthode par absorption dans l'infrarouge après combustion dans un four à induction (méthode pratique) (ISO 15350:2000)

Ta slovenski standard je istoveten z: EN ISO 15350:2010

ICS:

77.080.01 Železne kovine na splošno Ferrous metals in general

SIST EN ISO 15350:2010

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 15350:2010](#)

<https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6ff31d28b/sist-en-iso-15350-2010>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 15350

April 2010

ICS 77.080.01

English Version

**Steel and iron - Determination of total carbon and sulfur content
- Infrared absorption method after combustion in an induction
furnace (routine method) (ISO 15350:2000)**

Aciers et fontes - Dosage du carbone et du soufre totaux -
Méthode par absorption dans l'infrarouge après combustion
dans un four à induction (méthode pratique) (ISO
15350:2000)

Stahl und Eisen - Bestimmung der Gesamtgehalte an
Kohlenstoff und Schwefel - Infrarotabsorptionsverfahren
nach Verbrennung in einem Induktionsofen
(Standardverfahren) (ISO 15350:2000)

This European Standard was approved by CEN on 18 March 2010.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN Management Centre or to any CEN member.

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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

Contents

Page

Foreword.....3

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

SIST EN ISO 15350:2010

<https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6ff31d28b/sist-en-iso-15350-2010>

Foreword

The text of ISO 15350:2000 has been prepared by Technical Committee ISO/TC 17 "Steel" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 15350:2010 by Technical Committee ECISS/TC 102 "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 October 2010, and conflicting national standards shall be withdrawn at the latest by October 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

iTeh STANDARD PREVIEW
Endorsement notice
(standards.iteh.ai)

The text of ISO 15350:2000 has been approved by CEN as a EN ISO 15350:2010 without any modification.

[SIST EN ISO 15350:2010](https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6ff31d28b/sist-en-iso-15350-2010)

<https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6ff31d28b/sist-en-iso-15350-2010>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 15350:2010

<https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6ff31d28b/sist-en-iso-15350-2010>

INTERNATIONAL STANDARD

ISO
15350

First edition
2000-12-15

Steel and iron — Determination of total carbon and sulfur content — Infrared absorption method after combustion in an induction furnace (routine method)

Aciers et fontes — Dosage du carbone et du soufre totaux — Méthode par absorption dans l'infrarouge après combustion dans un four à induction (méthode pratique)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 15350:2010

<https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6fb1d28b/sist-en-iso-15350-2010>



Reference number
ISO 15350:2000(E)

© ISO 2000

ISO 15350:2000(E)**PDF disclaimer**

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 15350:2010](https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6ff31d28b/sist-en-iso-15350-2010)

<https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6ff31d28b/sist-en-iso-15350-2010>

© ISO 2000

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.ch
Web www.iso.ch

Printed in Switzerland

Contents

Page

Foreword.....	iv
1 Scope	1
2 Normative references	1
3 Principle.....	2
4 Reagents.....	2
5 Apparatus	3
6 Test method.....	3
7 Sampling.....	4
8 Procedure	4
9 Expression of results	10
10 Test report	11
Annex A (informative) Examples of diagram for analytical principles	13
Annex B (informative) Example calculation of a linearity check.....	19
Annex C (informative) Additional information on international cooperative tests.....	20
Annex D (informative) Graphical representation of precision data	24

SIST EN ISO 15350:2010

<https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6ff31d28b/sist-en-iso-15350-2010>

ISO 15350:2000(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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 15350 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 1, *Methods of determination of chemical composition*.

Annexes A to D of this International Standard are for information only.

ITEH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 15350:2010](https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6fb31d28b/sist-en-iso-15350-2010)

<https://standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6fb31d28b/sist-en-iso-15350-2010>

Steel and iron — Determination of total carbon and sulfur content — Infrared absorption method after combustion in an induction furnace (routine method)

1 Scope

This International Standard specifies an infrared absorption method, after combustion in an induction furnace, for the determination of the total carbon and sulfur content in steel and iron.

The method is applicable to carbon contents of mass fraction between 0,005 % and 4,3 % and to sulfur contents of mass fraction between 0,000 5 % and 0,33 %.

This method is intended to be used in normal production operations and is intended to meet all generally accepted, good laboratory practices of the type expected by recognized laboratory accreditation agencies. It uses commercially available equipment, is calibrated and calibration verified using steel and iron certified reference materials, and its performance is controlled using normal statistical process control (SPC) practices.

This method can be used in the single element mode, i.e., determination of carbon and sulfur independently or in the simultaneous mode, i.e., determination of carbon and sulfur concurrently.

iteh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 15350:2010](#)

2 Normative references

[standards.iteh.ai/catalog/standards/sist/a0ac78e7-e9a1-44a0-95ee-21a6fb31d28b/sist-en-iso-15350-2010](#)

The following normative documents contain provisions which, through reference in this text, constitute provisions of this International Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 437:1982, *Steel and cast iron — Determination of total carbon content — Combustion gravimetric method.*

ISO 4934:1980, *Steel and cast iron — Determination of sulfur content — Gravimetric method.*

ISO 4935:1989, *Steel and iron — Determination of sulfur content — Infrared absorption method after combustion in an induction furnace.*

ISO 5725-1:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions.*

ISO 5725-2:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 2: Basic method for the determination of repeatability and reproducibility of a standard measurement method.*

ISO 5725-3:1994, *Accuracy (trueness and precision) of measurement methods and results — Part 3: Intermediate measures of the precision of a standard measurement method.*

ISO 9556:1989, *Steel and Iron — Determination of total carbon content — Infrared absorption method after combustion in an induction furnace.*

ISO 10701:1994, *Steel and iron — Determination of sulfur content — Methylene blue spectrophotometric method.*

ISO 15350:2000(E)

ISO 13902:1997, *Steel and iron — Determination of high sulfur content — Infrared absorption method after combustion in an induction furnace.*

ISO 14284:1996, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition.*

3 Principle

3.1 Carbon

The carbon is converted to carbon monoxide and/or carbon dioxide by combustion in a stream of oxygen. Measurement is by infrared absorption of the carbon monoxide and carbon dioxide carried by a current of oxygen.

3.2 Sulfur

The sulfur is converted to sulfur dioxide by combustion in a stream of oxygen. Measurement is by infrared absorption of the sulfur dioxide carried by a current of oxygen.

4 Reagents

4.1 Acetone, the residue after evaporation shall have a mass fraction less than 0,000 5 %.

4.2 Cyclohexane, the residue after evaporation shall have a mass fraction less than 0,000 5 %.

4.3 Inert ceramic, attapulques clay impregnated with sodium hydroxide and having particle sizes from 0,7 mm to 1,2 mm for absorption of carbon dioxide.

4.4 Pure iron, used as an accelerator, 0,4 mm to 0,8 mm size with carbon and sulfur contents with a mass fraction of less than 0,001 % respectively.

4.5 Magnesium perchlorate, reagent grade, having particle size from 0,7 mm to 1,2 mm for absorption of moisture.

4.6 Oxygen, ultra high purity (mass fraction minimum 99,5 %)

An oxidation catalyst [copper(II) oxide or platinum] tube heated to 600 °C followed by suitable carbon dioxide and water absorbents shall be used when the presence of organic contaminants is suspected in the oxygen.

4.7 Platinum or platinized silica, heated to 350 °C for the conversion of carbon monoxide to carbon dioxide.

4.8 Accelerator, copper, tungsten-tin or tungsten for carbon determination and tungsten for sulfur determination, 0,4 mm to 0,8 mm size with carbon and sulfur contents of mass fraction less than 0,001 % and 0,000 5 % respectively.

4.9 Cellulose cotton, for the collection of sulfur trioxide

4.10 Steel and iron certified reference materials (CRMs), all reference materials used for calibration and calibration verification shall be certified by internationally-recognized bodies and validated by adequate performance on one or more national or international interlaboratory test programmes. Preference shall be given to materials that were certified using referee methods, e.g. ISO 437 and ISO 9556 for carbon, and ISO 4934, ISO 4935, ISO 10701 and ISO 13902 for sulfur, traceable to SI units as opposed to those based on other certified reference materials.

4.11 Steel and iron reference materials (RMs), those used for statistical process control of the method need not be certified, but adequate homogeneity data shall be available, either from the certifying body or from the laboratory that uses the material, in order to ensure the validity of the control data generated.