

<b>STN</b>	<b>Oceľ a železo</b> <b>Odber vzoriek a príprava vzoriek na stanovenie</b> <b>chemického zloženia (ISO 14284: 2022)</b>	<b>STN</b> <b>EN ISO 14284</b>  42 0500
------------	---	--

Steel and iron - Sampling and preparation of samples for the determination of chemical composition (ISO 14284:2022)

Táto norma obsahuje anglickú verziu európskej normy.  
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/23

Obsahuje: EN ISO 14284:2022, ISO 14284:2022

Oznámením tejto normy sa ruší  
STN EN ISO 14284 (42 0500) z júna 2003

**136291**

EUROPEAN STANDARD

**EN ISO 14284**

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2022

ICS 77.080.01

Supersedes EN ISO 14284:2002

English Version

## Steel and iron - Sampling and preparation of samples for the determination of chemical composition (ISO 14284:2022)

Aciers et fontes - Prélèvement et préparation des échantillons pour la détermination de la composition chimique (ISO 14284:2022)

Eisen und Stahl - Entnahme und Vorbereitung von Proben für die Bestimmung der chemischen Zusammensetzung (ISO 14284:2022)

This European Standard was approved by CEN on 1 October 2022.

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-CENELEC 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-CENELEC 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, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



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

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

**EN ISO 14284:2022 (E)**

<b>Contents</b>	<b>Page</b>
<b>European foreword.....</b>	<b>3</b>

## **European foreword**

This document (EN ISO 14284:2022) 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 May 2023, and conflicting national standards shall be withdrawn at the latest by May 2023.

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 14284:2002.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, Türkiye and the United Kingdom.

## **Endorsement notice**

The text of ISO 14284:2022 has been approved by CEN as EN ISO 14284:2022 without any modification.

# INTERNATIONAL STANDARD

# ISO 14284

Second edition  
2022-10

---

---

## **Steel and iron — Sampling and preparation of samples for the determination of chemical composition**

*Aciers et fontes — Prélèvement et préparation des échantillons pour  
la détermination de la composition chimique*



Reference number  
ISO 14284:2022(E)

© ISO 2022

**ISO 14284:2022(E)****COPYRIGHT PROTECTED DOCUMENT**

© ISO 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland

# Contents

Page

<b>Foreword</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Requirements for sampling and sample preparation</b> .....	<b>3</b>
4.1 General.....	3
4.2 Sample.....	4
4.2.1 Quality.....	4
4.2.2 Size.....	5
4.2.3 Identification.....	5
4.2.4 Sample conservation.....	5
4.2.5 Sample for arbitration.....	5
4.3 Sampling.....	6
4.3.1 Sample from a melt.....	6
4.3.2 Sample from a product.....	6
4.4 Preparation of a sample.....	6
4.4.1 Preliminary preparation of a sample.....	6
4.4.2 Test sample in the form of chips.....	6
4.4.3 Test sample in the form of fragments.....	7
4.4.4 Test sample in the form of a solid block.....	7
4.4.5 Preparation of a test sample by remelting.....	9
4.5 Safety precautions.....	9
4.5.1 Personal protection.....	9
4.5.2 Machinery.....	9
4.5.3 Hazardous materials.....	9
<b>5 Liquid iron for steelmaking and pig-iron production</b> .....	<b>9</b>
5.1 General.....	9
5.2 Spoon sampling.....	10
5.2.1 Methods.....	10
5.2.2 Maintenance of equipment.....	11
5.3 Probe sampling.....	11
5.3.1 General.....	11
5.3.2 Methods.....	12
5.4 Preparation of a test sample.....	12
5.4.1 Preliminary preparation.....	12
5.4.2 Test sample for a chemical method.....	12
5.4.3 Test sample for a thermal method.....	12
5.4.4 Test sample for a physical method.....	12
<b>6 Liquid iron for cast iron production</b> .....	<b>13</b>
6.1 General.....	13
6.2 Spoon sampling.....	13
6.2.1 General.....	13
6.2.2 Methods.....	13
6.2.3 Chilled sample.....	14
6.2.4 Non-chilled sample.....	14
6.2.5 Maintenance of equipment.....	14
6.3 Probe sampling.....	15
6.4 Preparation of a test sample.....	15
6.4.1 Preliminary preparation.....	15
6.4.2 Test sample for chemical methods.....	15
6.4.3 Test sample for thermal methods.....	16
6.4.4 Test sample for physical methods.....	16

**ISO 14284:2022(E)**

6.5	Sampling and sample preparation for the determination of oxygen and nitrogen.....	16
6.5.1	General.....	16
6.5.2	Method.....	16
6.5.3	Preparation of the test portion.....	16
<b>7</b>	<b>Liquid steel for steel production.....</b>	<b>17</b>
7.1	General.....	17
7.2	Spoon sampling.....	17
7.2.1	Methods.....	17
7.2.2	Maintenance of equipment.....	17
7.3	Probe sampling.....	18
7.3.1	General.....	18
7.3.2	Methods.....	18
7.4	Preparation of a test sample.....	18
7.4.1	Preliminary preparation.....	18
7.4.2	Test sample for chemical methods.....	18
7.4.3	Test sample for thermal methods.....	19
7.4.4	Test sample for physical methods.....	19
7.5	Sampling and sample preparation for the determination of nitrogen and oxygen.....	19
7.5.1	Methods of sampling.....	19
7.5.2	Preparation of the test portion.....	20
7.6	Sampling and sample preparation for the determination of hydrogen.....	20
7.6.1	General.....	20
7.6.2	Methods of sampling.....	21
7.6.3	Preparation of the test portion.....	21
<b>8</b>	<b>Pig-irons.....</b>	<b>21</b>
8.1	General.....	21
8.2	Increment sampling.....	21
8.2.1	Number of increments.....	21
8.2.2	Methods.....	22
8.2.3	Consignment of mixed pig-irons.....	22
8.3	Preparation of a test sample.....	22
8.3.1	General.....	22
8.3.2	Test sample for chemical methods.....	23
8.3.3	Test sample for thermal methods.....	23
8.3.4	Test sample for physical methods.....	24
<b>9</b>	<b>Cast iron products.....</b>	<b>24</b>
9.1	General.....	24
9.2	Sampling and sample preparation.....	24
9.2.1	General.....	24
9.2.2	Test sample for chemical methods.....	25
9.2.3	Sample in the form of a solid block for analysis by thermal methods.....	26
9.2.4	Test sample for physical methods.....	26
<b>10</b>	<b>Steel products.....</b>	<b>26</b>
10.1	General.....	26
10.2	Selection of a laboratory sample or a test sample from a cast product.....	27
10.3	Selection of a laboratory sample or a test sample from a wrought product.....	27
10.3.1	General.....	27
10.3.2	Sections.....	27
10.3.3	Plates or slabs.....	27
10.3.4	Light sections, bars, rods, sheets, strips and wires.....	27
10.3.5	Tubes and pipes.....	29
10.4	Preparation of a test sample.....	29
10.4.1	General.....	29
10.4.2	Test sample in the form of chips.....	29
10.4.3	Test sample in the form of a solid block.....	29
10.5	Sampling of leaded steel.....	30



10.6	Sampling and sample preparation for the determination of oxygen .....	30
10.6.1	General .....	30
10.6.2	Methods of sampling .....	30
10.6.3	Preparation of a test portion .....	31
10.7	Sampling and sample preparation for the determination of hydrogen .....	31
10.7.1	General .....	31
10.7.2	Methods of sampling .....	31
10.7.3	Preparation of a test portion .....	32
<b>Annex A (informative) Sampling probes for use with liquid iron and steel .....</b>		<b>33</b>
<b>Annex B (informative) Sampling probes for use with liquid steel for the determination of hydrogen .....</b>		<b>41</b>
<b>Bibliography .....</b>		<b>44</b>

## ISO 14284:2022(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*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 459/SC 2, *Methods of chemical analysis for iron and steel*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 14284:1996), which has been technically revised. The main changes are as follows:

- figures updated;
- [Clause 3](#) updated;
- text updated;
- new sampling probes added;
- units changed to SI units.

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 iron — Sampling and preparation of samples for the determination of chemical composition**

## **1 Scope**

This document specifies methods for sampling and sample preparation for the determination of the chemical composition of pig irons, cast irons and steels.

Methods are specified for both liquid and solid metal.

## **2 Normative references**

There are no normative references in this document.

**koniec náhľadu – text ďalej pokračuje v platenej verzii STN**