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NSAI Standards

Irish Standard
I.S. EN ISO 4946:2016

Steel and cast iron - Determination of copper - 2,2'-Biquinoline spectrophotometric method (ISO 4946:2016)

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National Foreword

I.S. EN ISO 4946:2016 is the adopted Irish version of the European Document EN ISO 4946:2016, Steel and cast iron - Determination of copper - 2,2'-Biquinoline spectrophotometric method (ISO 4946:2016)

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 4946

March 2016

ICS 77.080.01

Supersedes EN 24946:1990

English Version

Steel and cast iron - Determination of copper - 2,2'-Biquinoline spectrophotometric method (ISO 4946:2016)

Aciers et fontes - Détermination du cuivre - Méthode spectrophotométrique au 2,2'-biquinolyle (ISO 4946:2016)

Stahl und Gusseisen - Bestimmung des Kupferanteils - Spektrophotometrisches Verfahren mit 2,2'-Biquinoline (ISO 4946:2016)

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European foreword

This document (EN ISO 4946:2016) has been prepared by Technical Committee ISO/TC 17 “Steel” in collaboration with 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of an identical text or by endorsement, at the latest by September 2016, and conflicting national standards shall be withdrawn at the latest by September 2016.

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INTERNATIONAL STANDARD

ISO 4946

Second edition
2016-02-01

Steel and cast iron — Determination of copper — 2,2'-Biquinoline spectrophotometric method

Aciers et fontes — Détermination du cuivre — Méthode spectrophotométrique au 2,2'-biquinolyle

Reference number
ISO 4946:2016(E)

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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).

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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 WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information.

The committee responsible for this document is ISO/TC 17, *Steel*, Subcommittee SC 1, *Methods of determination of chemical composition*.

This second edition cancels and replaces the first edition (ISO 4946:1984), which has been technically revised to include the following changes:

— correction of the specification of plotting the calibration graphs in 7.4.3;

— editorial revision of some items in accordance with the updated ISO/IEC Directives, Part 2.

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Steel and cast iron — Determination of copper — 2,2'-Biquinoline spectrophotometric method

1 Scope

This International Standard specifies a spectrophotometric method for the determination of copper in steel and cast iron by 2,2'-biquinoline.

The method is applicable to the determination of copper mass fraction in the range of 0,02 % and 5 %.

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 648, *Laboratory glassware — Single-volume pipettes*

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

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 Principle

Dissolution of a test portion in appropriate acids.

Fuming with perchloric acid to remove hydrochloric and nitric acids and dehydrate silicic acid.

Reduction of copper(II) to copper(I) in hydrochloric acid solution by means of ascorbic acid. Formation of a coloured compound of copper(I) with 2,2'-biquinoline.

Spectrophotometric measurement at a wavelength of about 545 nm.

4 Reagents

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

4.1 High-purity iron, containing copper 0,001 % (mass fraction) or less.

4.2 Hydrochloric acid, ρ approximately 1,19 g/ml.

4.3 Nitric acid, ρ approximately 1,40 g/ml.

4.4 Perchloric acid, ρ approximately 1,54 g/ml.

WARNING — Perchloric acid vapour might cause explosions in the presence of ammonia, nitrous fumes or organic material in general.

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