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BSI Standards Publication

Cast irons — Determination of non-combined carbon content — Infrared absorption method after combustion in an induction furnace

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National foreword

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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).

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).

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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 World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

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

This first edition Technical Specification replaces the first edition Technical Report (ISO/TR 10719:1994), which has been technically revised. The following changes have been made:

— steels have been deleted from the scope;

— the possibility to establish the calibration curve by means of certified reference materials has been added;

— assessment of the precision data has been revised.

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Cast irons — Determination of non-combined carbon content — Infrared absorption method after combustion in an induction furnace

1 Scope

This document specifies an infrared absorption method after combustion in an induction furnace for the determination of non-combined carbon content in cast irons.

The method is applicable to non-combined carbon contents between 1,0 % (mass fraction) and 3,0 % (mass fraction).

Elements ordinarily present do not interfere. However, some alloyed cast irons, when extensively heat treated, contain carbides that are not soluble when using this method and may give high values for non-combined carbon.

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.

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

For the purposes of this document, the following terms and definitions apply.

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

3.1
non-combined carbon
graphitic carbon
carbon that is not dissolved by methanol and nitric and hydrofluoric acids

4 Principle

Decomposition of a test portion with nitric acid in the presence of methanol and treatment with hydrofluoric acid. Removal of the non-combined carbon by filtering through a glass-fibre filter.

Combustion of the glass-fibre filter containing the non-combined carbon in a flow of oxygen at a high temperature, using a high-frequency induction furnace, in the presence of pure iron and an accelerator. Transformation of carbon into carbon dioxide and/or carbon monoxide.

Measurement by infrared absorption of the carbon dioxide and/or carbon monoxide, carried by the current of oxygen.

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