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**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

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

(English Translation)

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Foreword

This Standard identically uses ISO 15350.2000.

For easy use, this Standard made the following editorial modifications.

- a) modified "this International Standard" to "this Standard";
- b) used decimal point "." to replace "," used as decimal point in ISO 15350.2000;
- c) deleted the foreword of ISO 15350.2000;
- d) moved the position of Table 6 in ISO 15350.2000 below 9.2.2 in this Standard.

Annex A, Annex B, Annex C and Annex D of this Standard are informative.

This Standard was proposed by China Iron and Steel Industry Association.

This Standard shall be under the jurisdiction of National Technical Committee on Steel of Standardization Administration of China.

Main drafting organization of this Standard. Iron and Steel Research Institute

Main drafter of this Standard. Yang Guorong.

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

1 Scope

This 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.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this Standard are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below.

3 Principle

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

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.

5 Apparatus

Ordinary laboratory equipment plus the following shall be used.

6 Test method

This test method is written for use with commercial analysers, equipped to carry out the included operations automatically and calibrated using steels and irons of known carbon and sulfur contents.

During specimen combustion, the flow of CO₂ with its oxygen gas carrier is routed through the measuring chamber (see 5.1) while oxygen alone passes through the reference chamber.

7 Sampling

Carry out sampling in accordance with ISO 14284 or appropriate national standards for iron and steel.

8 Procedure

Assemble the apparatus and prepare it for operation according to the manufacturer's instructions. Test the furnace and analyser to ensure the absence of leaks. Make a minimum of five determinations using a specimen with measurable concentrations of carbon and sulfur and accelerator as directed in 8.3 before attempting to calibrate the system or determine the blank.

9 Expression of results

A planned trial of this method was carried out by 31 laboratories, at 20 levels of carbon, each laboratory making three determinations of carbon content at each level.

The data obtained showed a logarithmic relationship between sulfur content and repeatability (*r*) and reproducibility (*R* and *R_w*) of the test results (see note

3 of 8.2.1) as summarized in Table 6. The graphical representation of the figures

is given in annex D.

10 Test report

The test report shall include the following information.

Annex A

(Informative)

Examples of diagram for analytical principles

Annex B

(Informative)

Examples calculation of a linearity check

Test. Carbon over the mass fraction range 0.005% to 0.12%

Reference materials.

Annex C

(Informative)

Additional information on international cooperative tests

Tables 5 and 6 were derived from the results of international analytical trials carried out in 1995 on 20 steel samples in 13 countries involving 31 laboratories.

The results of the trials were reported in document ISO/TC 17/SC 1 N 1177, revised in 1998.

Annex D

(Informative)

Graphical representation of precision data

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