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Chemical analysis of ferrous materials - Analysis of ferro-silicon - Determination of Al, Ti and P by inductively coupled plasma optical emission spectrometry

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TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CEN/TR 10353

November 2011

ICS 77.080.10

English Version

Chemical analysis of ferrous materials - Analysis of ferro-silicon - Determination of Al, Ti and P by inductively coupled plasma optical emission spectrometry

Analyse chimique des matériaux ferreux - Analyse du ferro-silicium - Détermination de Al, Ti et P par spectrométrie d'émission optique avec source à plasma induit

Chemische Analyse von Ferrolegierungen - Analyse von Ferrosilizium - Bestimmung von Al, Ti und P durch induktiv gekoppeltes Plasma und optische Emissionsspektrometrie

This Technical Report was approved by CEN on 24 April 2011. It has been drawn up by the Technical Committee ECISS/TC 102.

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Foreword

This document (CEN/TR 10353:2011) has been prepared by Technical Committee ECISS/TC 102 “Methods of chemical analysis for iron and steel”, the secretariat of which is held by SIS.

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1 Scope

This Technical Report describes an inductively coupled plasma optical emission spectrometric method for the determination of Al, Ti and P contents in ferro-silicon materials.

The method is applicable to:

— Al contents between 0,2 and 2 %;

— Ti contents between 0,02 and 0,25 %;

— P contents between 0,005 and 0,05 %.

The procedure is valid for the analytical lines given in Table 1. This table also gives, for each line, the spectral interferences, which shall be corrected.

NOTE The interferences extent as well as other possible interferences depend on the temperature in the plasma and on the optical resolution of the spectrometer used.

Table 1 — Spectral lines recommended together with the interferences which shall be corrected

Element	Wavelength (nm)	Interferences
Al	308,22	V
Ti	337,28	V, Ni
P	178,29	Mo

2 Normative references

The following referenced documents are indispensable for the application 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.

EN ISO 648, *Laboratory glassware — Single-volume pipettes (ISO 648:2008)*

EN ISO 1042, *Laboratory glassware — One-mark volumetric flasks (ISO 1042:1998)*

3 Principle

Dissolution of a test portion with nitric, hydrofluoric and perchloric acids. Addition of hydrochloric acid.

Filtration and ignition of the acid insoluble residue.

Fusion of the residue with sodium hydrogen sulphate, dissolution of the melt and addition of this solution to the reserved filtrate.

After suitable dilution and, if necessary, addition of an internal reference element, the solution is filtered and nebulised into an inductively coupled plasma optical emission spectrometer.

The intensity of the emitted light from each element is then measured (simultaneously with that emitted from the internal reference element, where relevant).

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