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**OPTICAL EMISSION ANALYSIS OF LOW  
ALLOY STEELS (ROUTINE METHOD) -  
GUIDELINES FOR THE PREPARATION OF  
STANDARD ROUTINE METHOD FOR  
OPTICAL EMISSION SPECTROMETRY**

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**CR 10316**

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ICS

English version

**Optical emission analysis of low alloy steels (routine method) -  
Guidelines for the preparation of standard routine method for  
optical emission spectrometry**

Analyse des aciers faiblement alliés par spectrométrie  
d'émission optique (méthode de routine) - Lignes  
directrices relatives à la préparation d'une méthode  
normalisée de routine pour la spectrométrie d'émission  
optique

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**CR 10316:2001 (E)**

**Contents**

**Foreword**.....3

**1 Scope and field of application**.....3

**2 Terms and definitions** .....3

**3 Basic principles of optical emission spectrometry** .....5

**4 Apparatus** .....5

**5 Interferences** .....8

**6 Performance criteria**.....9

**7 Optimization of instrument parameters** .....10

**8 Test sample preparation**.....11

**9 Calibration** .....11

**10 Analysis** .....12

**11 Safety** .....12

**Bibliography** .....13

## Foreword

This CEN Report has been prepared by Technical Committee ECISS/TC 20 "Methods of chemical analysis of ferrous products", the secretariat of which is held by SIS.

## 1 Scope and field of application

The purpose of this document is to describe concepts and procedures for calibration and analysis of the equipment based on spark source optical emission spectrometry. Optical emission spectrometers are equipments that provide a quality and quantity characterization of electromagnetic radiation which is emitted by a test sample when excited by a suitable source.

## 2 Terms and definitions

For the purposes of this CEN Report, the following definitions apply:

### 2.1

#### **absolute error**

the difference between the measured and the true value

### 2.2

#### **accuracy**

the closeness of agreement between an observed value and an accepted true value

### 2.3

#### **analyte line**

the spectral line of an element which is used to establish the element concentration

### 2.4

#### **background equivalent concentration**

the quantity of analyte which, when subjected to excitation, provides a net intensity equal to the spectral background

### 2.5

#### **calibration**

the series of operations which, under specified conditions, establishes the relationship between the instrument output and the known values of the element being determined

### 2.6

#### **calibration curve**

the mathematical or graphical relationship between instrument output and known values of an element, under given conditions

### 2.7

#### **certified reference material**

a reference material whose properties are certified by a technically valuable procedure and which is provided with a certificate, either attached or referenced, issued by a certification body

### 2.8

#### **drift**

a slow change over time in instrument response

### 2.9

#### **instrumental drift correction**

the correction of instrumental drift with time, in order to keep calibration constant

## **CR 10316:2001 (E)**

### **2.10**

#### **limit of detection**

the minimum concentration at which the signal generated by a given element can be positively recognised above any background signals with a specified degree of certainty

### **2.11**

#### **matrix**

the sum of the principal elements in a sample

### **2.12**

#### **matrix effect**

the effect of the main constituents of a spectrographic sample on the intensity of the analyte line of the element being measured

### **2.13**

#### **nominal value**

the value used to indicate a characteristic of a reference material

### **2.14**

#### **primary standard**

a standard showing the best metrological properties in a specified field

### **2.15**

#### **random error**

the component of an error of measurement which, during several measurements of the same measurand, changes with an unknown pattern

### **2.16**

#### **reference material**

a material or substance which has sufficiently defined properties to be used for the following purposes: calibrate an instrument, evaluate a measuring system or assign values to other materials

### **2.17**

#### **reference standard**

a standard, generally with the best metrologic properties available at a certain location, which is used for the metrological measurements performed at that location

### **2.18**

#### **relative error**

the absolute error divided by the true value

### **2.19**

#### **repeatability**

the value within which the absolute difference between two single test results obtained with the same method in the shortest possible time by the same operator, using the same apparatus, at the same calibration values and under the same drift conditions may be expected to lie within a specified probability (95 % if not indicated)

### **2.20**

#### **reproducibility**

the value below which the difference between two single test results obtained with the same method on the same material by different operators using different instruments at different laboratories and at different times may be expected to lie within a specified probability (95 % if not indicated)

### **2.21**

#### **secondary standard**

a standard whose value is established by comparison with a primary standard

### **2.22**

#### **span**

the magnitude of the difference between two limits in the nominal range of an instrument

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