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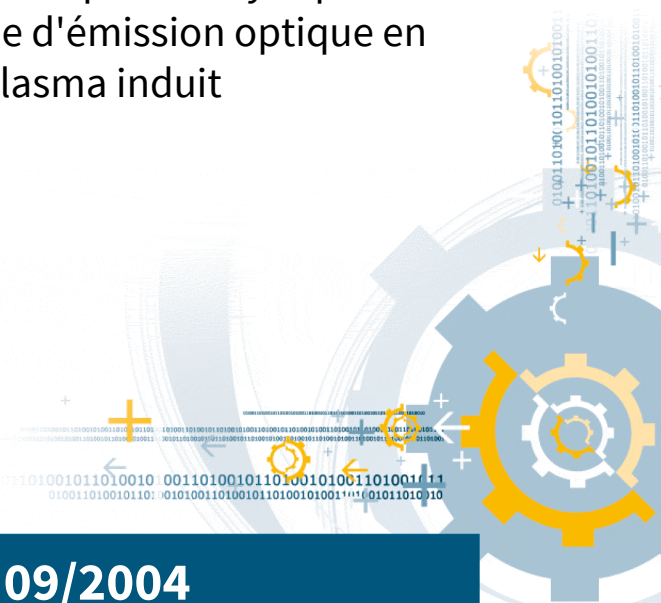
ILNAS-EN 14242:2004

Aluminium and aluminium alloys - Chemical analysis - Inductively coupled plasma optical emission spectral analysis

Aluminium und Aluminiumlegierungen -
Chemische Analyse - Optische
Emissionspektralanalyse mit induktiv
gekoppelter Plasmaanregung

Aluminium et alliages d'aluminium -
Analyse chimique - Analyse par
spectrométrie d'émission optique en
plasma induit

09/2004



National Foreword

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EUROPEAN STANDARD ILNAS-EN 14242:2004 **EN 14242**
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English version

**Aluminium and aluminium alloys - Chemical analysis -
Inductively coupled plasma optical emission spectral analysis**

Aluminium et alliages d'aluminium - Analyse chimique -
Analyse par spectrométrie d'émission optique en plasma
induit

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This European Standard was approved by CEN on 1 July 2004.

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CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 14242:2004) has been prepared by Technical Committee CEN/TC 132 "Aluminium and aluminium alloys", the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

Within its programme of work, Technical Committee CEN/TC 132 requested CEN/TC 132/WG 17 "Chemical analysis" to prepare the following standard:

EN 14242, *Aluminium and aluminium alloys — Chemical analysis — Inductively coupled plasma optical emission spectral analysis*.

This document includes a Bibliography.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Introduction

This document describes detailed steps for dissolution and preparation of calibration solutions. The preferred use is for certification and referee analysis. All instrumentation, including software used in the testing laboratories, are different and subject to change. Therefore, general criteria for calibration and measurement are specified.

This method has to be used with primary reference materials whose mass of substance have a significant smaller uncertainty as required of the repeatability of the testing procedure.

1 Scope

This document specifies the inductively coupled plasma optical emission spectral analysis (ICP-OES) of aluminium and aluminium alloys. This method is applicable to the determination of silicon, iron, copper, manganese, magnesium, chromium, nickel, zinc, titanium, gallium, vanadium, beryllium, bismuth, calcium, cadmium, cobalt, lithium, sodium, lead, antimony, tin, strontium, and zirconium in aluminium and aluminium alloys.

NOTE The national safety instructions should be taken into consideration.

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.

prEN 12258-2:2001, *Aluminium and aluminium alloys — Terms and definitions — Part 2: Chemical analysis*.

prEN 14361, *Aluminium and aluminium alloys — Chemical analysis — Sampling from metal melts*.

EN ISO 3696, *Water for analytical laboratory use — Specification and test methods (ISO 3696:1987)*.

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:1999)*.

ISO 3534-1, *Statistics — Vocabulary and symbols — Part 1: Probability and general statistical terms*.

3 Terms and definitions

For the purposes of this document, the terms and definitions given in prEN 12258-2:2001 apply.

4 Principle

A test portion is dissolved with:

- sodium hydroxide solution and acidification with a mixture of nitric acid and hydrochloric acid; or
- nitric acid and hydrofluoric acid; or
- a mixture of hydrochloric acid and nitric acid; or
- hydrochloric acid and hydrogen peroxide

according to the alloy type and the element contents to be determined. This solution is nebulized and excited in an inductively coupled plasma connected with an optical emission spectrometer. The emission signals on selected analytical lines (see Annex A) are compared with those of calibration solutions.

The ranges of application and the accuracy of the method or any alternative steps shall be validated by the laboratory. Approximate ranges of application are given in Annex A.