

Aluminium and aluminium alloys - Chemical analysis - Guideline for spark optical emission spectrometric analysis

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EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

<p>Käesolev Eesti standard EVS-EN 14726:2005 sisaldab Euroopa standardi EN 14726:2005 ingliskeelset teksti.</p> <p>Käesolev dokument on jõustatud 25.11.2005 ja selle kohta on avaldatud teade Eesti standardiorganisatsiooni ametlikus väljaandes.</p> <p>Standard on kättesaadav Eesti standardiorganisatsioonist.</p>	<p>This Estonian standard EVS-EN 14726:2005 consists of the English text of the European standard EN 14726:2005.</p> <p>This document is endorsed on 25.11.2005 with the notification being published in the official publication of the Estonian national standardisation organisation.</p> <p>The standard is available from Estonian standardisation organisation.</p>
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<p>Käsitlusala:</p> <p>This European Standard gives guidance on the criteria and the fundamental operation procedure governing the spark optical emission spectral analysis (S-OES) of metal samples, beginning with sampling, through sample preparation to reporting the test, as well as the requirements of the whole spark source spectrometric procedure which shall be fulfilled with respect to: - the observance of the agreed precision and trueness [ISO 3534-1, ISO 5725] of the analytical results with reference to the agreed sample or sample area</p>	<p>Scope:</p> <p>This European Standard gives guidance on the criteria and the fundamental operation procedure governing the spark optical emission spectral analysis (S-OES) of metal samples, beginning with sampling, through sample preparation to reporting the test, as well as the requirements of the whole spark source spectrometric procedure which shall be fulfilled with respect to: - the observance of the agreed precision and trueness [ISO 3534-1, ISO 5725] of the analytical results with reference to the agreed sample or sample area</p>
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ICS 77.040.30, 77.120.10

Võtmesõnad:

ICS 77.120.10; 77.040.30

English Version

Aluminium and aluminium alloys - Chemical analysis - Guideline
for spark optical emission spectrometric analysis

Aluminium et alliages d'aluminium - Analyse chimique -
Directives pour l'analyse par spectrométrie d'émission
optique à étincelles

Aluminium und Aluminiumlegierungen - Chemische
Analyse - Leitfaden für die optische
Funkenemissionsspektralanalyse

This European Standard was approved by CEN on 22 July 2005.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

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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Contents

Page

Foreword	3
Introduction	4
1 Scope	5
2 Normative references	5
3 Terms and definitions	5
4 Symbols and abbreviations	5
5 Review and principle of test method	6
6 Consumables and calibration materials	6
6.1 Consumables	6
6.2 Reference material and recalibration samples	6
7 Testing equipment	7
7.1 Spark spectrometer	7
7.2 Equipment for sample preparation	8
8 Samples	8
8.1 Requirements on test samples	8
8.2 Sampling	8
9 Sample preparation	9
10 Operating conditions of the spectrometer	10
11 Taking measurements	10
12 Calibration and evaluation (methods of calculation)	11
12.1 Fundamental principles	11
12.2 Standard and reference materials	12
12.3 Base calibration	13
12.4 Recalibration	14
12.5 Alloy group calibration with simultaneous calibration	16
13 Accuracy (precision and trueness)	16
13.1 General	16
13.2 Possibility of error	16
13.3 Measuring and calibration uncertainty	17
13.4 Comprehensive investigation of accuracy	18
14 Inspection	19
14.1 General	19
14.2 Continuous supervision	19
14.3 Checking the analytical sample	19
14.4 Analytical capability	19
15 Availability of the analytical system	20
16 Test report	20
Annex A (informative) Representative sparking area	21
Bibliography	22

Foreword

This European Standard (EN 14726:2005) 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 2006, and conflicting national standards shall be withdrawn at the latest by March 2006.

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

In optical atomic emission spectral analysis (OES) with excitation by electric spark discharges, (S-OES), a small portion of the sample is thermally atomized through the erosion of an electric spark. In the spark discharge, the aerosol is atomized, partially ionised and excited to emit optical radiation. The characteristic radiation for each element is used in OES for element detection and for the quantitative determination of the element contents.

The test result obtained on a small test portion (mostly less than one milligram per spark spot) of one or more laboratory samples is referred either to a laboratory sample or to many tons of a melt or a cast product of aluminium or aluminium alloys. Cast structure and segregation interfere with measurement.

S-OES is suitable for determining the chemical composition of metal samples as defined in technical specifications. S-OES serves as inspection, test and measuring equipment for alloy compositions to control and inspect the manufacturing and casting processes. For those purposes, laboratory samples are taken from the liquid metal after melting down of the alloying constituents and during casting in different process stages.

Besides process inspection, S-OES, within the framework of a chemical-analytical service, facilitates the preparation of a test report which refers to the laboratory sample or to an agreed sample area of that sample.

The testing equipment, including software used in the testing laboratories, is subject to change. Therefore, these guidelines describe the common principles.

It gives guidance to specific criteria which should be met and the detailed documentation for the laboratory procedures to obtain traceable test results with uncertainty intervals.

1 Scope

This European Standard gives guidance on the criteria and the fundamental operation procedure governing the spark optical emission spectral analysis (S-OES) of metal samples, beginning with sampling, through sample preparation to reporting the test, as well as the requirements of the whole spark source spectrometric procedure which shall be fulfilled with respect to:

- observance of the agreed precision and trueness [ISO 3534-1, ISO 5725-1] of the analytical results with reference to the agreed sample or sample area;
- traceability of the analytical results to the international base units — mass (kg) and amount of substance (mol);
- proof of agreement between the spark spectrometric result and the average composition of the supplied metal sample within the given uncertainty [ISO 3534-1] of the analytical result;
- comparability of the test results between different laboratories;
- as far as possible, a trouble-free operation of the spark spectrometer.

These guidelines refer to computer-controlled simultaneously measuring spectrometers for the analysis of solid samples.

2 Normative references

The following referenced documents are indispensable for the application of this European Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12258-2:2004, *Aluminium and aluminium alloys — Terms and definitions — Part 2: Chemical analysis*

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

EN ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories (ISO/IEC 17025:2005)*

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

ISO 3534-2, *Statistics — Vocabulary and symbols — Part 2: Statistical quality control*

ISO 5725-1, *Accuracy (trueness and precision) of measurement methods and results — Part 1: General principles and definitions*

ISO Guide 30, *Terms and definitions used in connection with reference materials*

3 Terms and definitions

For the purposes of this European Standard the terms and definitions given in EN 12258-2:2004 apply.

4 Symbols and abbreviations

Symbols and formula signs are defined immediately by the relevant formulae. Abbreviations are put in brackets immediately after a term first appears in the text (e.g. S-OES).