



National Standards Authority of Ireland

IRISH STANDARD

I.S. ENV 14138:2002

ICS 77.120.60

**LEAD AND LEAD ALLOYS - ANALYSIS BY  
FLAME ATOMIC ABSORPTION  
SPECTROMETRY (FAAS) OR INDUCTIVELY  
COUPLED PLASMA EMISSION  
SPECTROMETRY (ICP-ES), AFTER  
SEPARATION BY CO-PRECIPITATION**

National Standards  
Authority of Ireland  
Dublin 9  
Ireland

Tel: (01) 807 3800  
Tel: (01) 807 3838

*This Irish Standard was  
published under the  
authority of the National  
Standards Authority of  
Ireland  
and comes into effect on  
March 1, 2002*

**NO COPYING WITHOUT NSAI  
PERMISSION EXCEPT AS  
PERMITTED BY COPYRIGHT  
LAW**

© NSAI 2002

**Price Code F**

Údarás um Chaighdeáin Náisiúnta na hÉireann



EUROPEAN PRESTANDARD  
PRÉNORME EUROPÉENNE  
EUROPÄISCHE VORNORM

**ENV 14138**

December 2001

ICS 77.120.60

English version

**Lead and lead alloys - Analysis by flame atomic absorption spectrometry (FAAS) or inductively coupled plasma emission spectrometry (ICP-ES), after separation by co-precipitation**

Plomb et alliages de plomb - Analyse par spectrométrie d'absorption atomique dans la flamme (FAAS) ou par spectrométrie d'émission à plasma inductif couplé (ICP-ES), après séparation par co-précipitation

Blei und Bleilegerungen - Analyse durch Flammen-Atomabsorptionsspektrometrie (FAAS) oder Emission-Spektrometrie mit induktiv gekoppeltem Plasma (ICP-ES), nach Abtrennung durch Mitfällung

This European Prestandard (ENV) was approved by CEN on 18 November 2001 as a prospective standard for provisional application.

The period of validity of this ENV is limited initially to three years. After two years the members of CEN will be requested to submit their comments, particularly on the question whether the ENV can be converted into a European Standard.

CEN members are required to announce the existence of this ENV in the same way as for an EN and to make the ENV available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force (in parallel to the ENV) until the final decision about the possible conversion of the ENV into an EN is reached.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

## Contents

	page
Foreword.....	4
1 Scope .....	5
2 Normative references .....	5
3 Principle .....	5
3.1 Preparation of the test solution.....	5
3.2 Instrumental techniques .....	6
3.2.1 Flame atomic absorption spectrometry (FAAS).....	6
3.2.2 Inductively coupled plasma emission spectrometry (ICP-ES).....	6
4 Apparatus .....	6
4.1 General.....	6
4.2 Volumetric glassware .....	6
4.3 Filtration system .....	6
4.4 Instruments.....	6
4.4.1 Flame atomic absorption spectrometer .....	6
4.4.2 Inductively coupled plasma emission spectrometer .....	7
5 Reagents .....	7
5.1 General.....	7
5.2 Nitric acid (HNO <sub>3</sub> ) .....	7
5.2.1 Concentrated nitric acid.....	7
5.2.2 Nitric acid 1:1 (V/V) .....	7
5.2.3 Nitric acid 1:2 (V/V) .....	7
5.3 Hydrochloric acid (HCl).....	7
5.3.1 Concentrated hydrochloric acid.....	7
5.3.2 Hydrochloric acid 1:1 (V/V) .....	7
5.4 Ammonia solution.....	7
5.5 Pure lead.....	7
5.6 Manganese nitrate solution .....	8
5.7 Potassium permanganate solution .....	8
5.8 Standard solutions .....	8
5.8.1 Standard solutions (1g/l).....	8
5.8.2 Standard solutions (100 mg/l).....	8
5.8.3 Standard solutions (10 mg/l).....	9
5.8.4 Multi-element solutions (either 10 mg/l or 100 mg/l).....	9
6 Sampling and sample preparation .....	9
7 Procedure .....	9
7.1 Preparation of the test solution.....	9
7.1.1 Dissolution.....	9
7.1.2 Co-precipitation with manganese dioxide.....	9
7.1.3 Test solution.....	9
7.2 Preparation of the synthetic test solution.....	9
7.3 Preparation of the blank test solution .....	10
7.4 Preparation of calibration solutions .....	10
8 Determination of elements by FAAS.....	10
8.1 General .....	10
8.2 Calibration and measurement of the test solution .....	11
8.3 Expression of results .....	11
8.3.1 Analyte recovery rate .....	11
8.3.2 Analyte content in the sample .....	11
9 Determination of elements by ICP-ES .....	12
9.1 General .....	12
9.2 Calibration and measurement of the test solution .....	12

<b>9.3</b>	<b>Expression of results .....</b>	<b>13</b>
<b>9.3.1</b>	<b>Analyte recovery rate .....</b>	<b>13</b>
<b>9.3.2</b>	<b>Analyte content in the sample.....</b>	<b>13</b>
<b>10</b>	<b>Test report .....</b>	<b>13</b>
	<b>Bibliography .....</b>	<b>14</b>

## ENV 14138:2001 (E)

### Foreword

This European Prestandard has been prepared by Technical Committee CEN /TC 306, "Lead and lead alloys", the secretariat of which is held by AFNOR.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to announce this European Prestandard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

### CAUTION FOR SAFETY AND TRAINING

The methods in this Prestandard are recommended for the certification of reference materials and as umpire methods in cases of a dispute. The importance of either application, and the paramount issue of safety, requires that they should only be carried out by fully-trained analysts who are experienced in all relevant techniques and the precautions necessary in the inherently hazardous environs of a laboratory, especially those required when using particularly hazardous apparatus and reagents used in some of these methods.

Where a particular hazard exists, this is given as a **DANGER** adjacent to the point in the text where the apparatus or reagent is referenced.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

- 
- [Looking for additional Standards? Visit Intertek Inform Infostore](#)
  - [Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation](#)
-