
**Chemical analysis of refractory products
by X-ray fluorescence (XRF) — Fused
cast-bead method**

*Analyse chimique des matériaux réfractaires par fluorescence de
rayons X — Méthode de la perle fondue*



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Contents

Page

Foreword	v
1 Scope	1
2 Normative references	1
3 Types of material	1
4 Principle	2
5 Apparatus	2
6 Sample grinding	3
7 Loss on ignition (and/or drying)	4
8 Flux	4
8.1 Choice of flux and ratio of flux to sample	4
8.2 Compensations for moisture in flux	5
9 Fusion casting procedures	5
9.1 Fusion of samples and casting of beads	5
9.2 Automatic bead preparation	7
9.3 Storage	7
9.4 Special problems	8
10 Calibration	8
10.1 Calibration standards	8
10.2 Reagents and series reference materials (SeRMs)	8
10.3 Calibration using reagents	10
10.4 Calibration using SeRMs	15
11 Corrections	17
11.1 Line-overlap correction	17
11.2 Background correction	17
11.3 Drift correction	18
11.4 Calculation of results	18
11.5 Software requirements	19
12 Reproducibility and repeatability	20
12.1 Fusion tests	20
12.2 Frequency of instrument tests	20
12.3 Maximum allowance differences of sample holders	20
12.4 Sample measuring positions	21
12.5 Instrument repeatability	21
12.6 Sequential systems	21
12.7 Dead time	22
12.8 Other tests	22
12.9 Flow gas	22
13 Accuracy determined by certified reference materials	22
13.1 Validation of synthetic calibrations	22
13.2 Validation of SeRM calibrations	22
13.3 Fresh beads of the CRMs or synthetic standards used to check SeRM calibrations	22
14 Definitions of limits of detection	23
15 Test report	23

Annex A (normative) Calibration range and required detection limits	24
Annex B (normative) Corrections for tungsten carbide grinding media	28
Annex C (informative) Examples of fluxes/flux ratios	30
Annex D (normative) Examples of CRM to be used to check synthetic calibrations	32
Annex E (normative) Examples of SeRM	38
Annex F (normative) Equation for theoretical calculations	43
Annex G (normative) Certified reference materials (CRMs)	44
Annex H (normative) Method of inter-element correction used to compensate for the effects of co-existing components when using SeRM for calibration	47
Annex I (normative) Standard deviations achieved with certified reference materials	68
Bibliography	75

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 12677 was prepared by Technical Committee ISO/TC 33, *Refractories*.

This second edition cancels and replaces the first edition (ISO 12677:2003), which has been technically revised. Although the method in this International Standard has been considerably modified editorially and in layout, the technical changes are limited. Some minor corrections have been made to certain equations. The only significant changes are a reference to a further International Standard method (being prepared) for the preparation of reduced materials for analysis by this standard, and instructions on how to add other constituents to calibrations at the end of 10.2.1, *Purity and preparation of reagents*.

Chemical analysis of refractory products by X-ray fluorescence (XRF) — Fused cast-bead method

1 Scope

This International Standard specifies a method for the chemical analysis of refractory and technical ceramic raw materials, intermediates and products, by means of the X-ray fluorescence (XRF) fused cast-bead method. Typical materials that can be analysed by this standard are given in Clause 3. This International Standard is not applicable to non-oxide materials, such as silicon carbides or nitrides, etc. The method is applicable to a wide range of materials containing a wide range of elements.

NOTE 1 The presence of significant amounts of certain elements, such as tin, copper, zinc and chromium, can present difficulties in the fusion process. In this case, the Bibliography can be referred to.

NOTE 2 Constituents at concentrations greater than 99 % (on a dried basis) are reported by difference, provided that all likely minor constituents and any loss on ignition have been determined. These figures can also be checked by direct determination.

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.

ISO Guide 35:2006, *Reference materials — General and statistical principles for certification*

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 26845, *Chemical analysis of refractories — General requirements for wet chemical analysis, atomic absorption spectrometry (AAS) and inductively coupled plasma atomic emission spectrometry (ICP-AES) methods*

3 Types of material

Listed below are various types of ceramic material that have been successfully analysed by this method and for which statistical data is available (see Annex I). The list is not exhaustive but serves as a guide to those using this International Standard for the first time.

- a) High alumina > 45 % Al_2O_3
- b) Alumino-silicate 7 % to 45 % Al_2O_3
- c) Silica > 93 % SiO_2
- d) Zircon
- e) Zirconia and zirconates
- f) Magnesia