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# International Standard



# 8557

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## Aluminium ores — Determination of hygroscopic moisture in analytical samples — Gravimetric method

*Minerais alumineux — Détermination de l'humidité hygroscopique des échantillons pour analyse — Méthode gravimétrique*

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[ISO 8557:1985](https://standards.itech.ai/catalog/standards/sist/ea3698d8-1e79-4b47-b850-b38a5a911b58/iso-8557-1985)

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**Descriptors** : minerals and ores, aluminium ores, tests, hygroscopic tests, determination, humidity, gravimetric analysis.

## 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8557 was prepared by Technical Committee ISO/TC 129, *Aluminium ores*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

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# Aluminium ores — Determination of hygroscopic moisture in analytical samples — Gravimetric method

## 1 Scope and field of application

This International Standard specifies a gravimetric loss of mass method for the determination of hygroscopic moisture in analytical samples of aluminium ores.

The method is applicable to products having hygroscopic moisture contents, expressed as water (H<sub>2</sub>O), in the range 0,1 to 5 % (*m/m*), and shall be used to correct the results obtained for aluminium and loss of mass at 1 075 °C to a dry basis.

NOTE — The hygroscopic moisture can be taken into account for other determinations by using a pre-dried sample prepared in accordance with ISO 8558.

## 2 Reference

ISO 8558, *Aluminium ores — Preparation of pre-dried test samples*.

## 3 Principle

Drying of the test portion in air at approximately 105 °C and recording of the loss of mass.

## 4 Material

**4.1 Desiccant:** activated alumina, magnesium perchlorate or diphosphorus pentoxide.

NOTE — Activated alumina should be freshly activated by heating overnight at 300 ± 10°C.

## 5 Apparatus

Ordinary laboratory apparatus and

**5.1 Weighing bottles,** of glass or metal, of diameter approximately 50 mm.

**5.2 Dishes,** flat bottom, for equilibration of samples with the laboratory atmosphere. The bottom of the dishes shall be about 20 cm<sup>2</sup> in area.

**5.3 Laboratory oven,** capable of being controlled at 105 ± 2 °C.

**5.4 Desiccator.**

## 6 Sampling and samples

### 6.1 Sample

Use an air-dried sample with a particle size of less than 150 µm.

### 6.2 Preparation of the test sample

Take approximately 10 g of the laboratory sample and transfer to a dish (5.2). Spread the sample evenly and allow to equilibrate with the laboratory atmosphere for a minimum of 2 h.

## 7 Procedure

### 7.1 Number of determinations

Carry out the determination in duplicate on each aluminium ore.

### 7.2 Preparation of the weighing bottle

Dry a weighing bottle and lid (5.1) by heating for 1 h in the laboratory oven (5.3), controlled at 105 ± 2 °C. Transfer bottle and lid to the desiccator (5.4), containing a suitable fresh desiccant (4.1), and allow to cool. Weigh to the nearest 0,000 1 g after slightly lifting the lid and quickly replacing it. Record the mass (*m*<sub>1</sub>).

NOTE — A heat sink introduced into the desiccator and comprising a substantial mass of metal may be used to significantly reduce the cooling time.

### 7.3 Test portions

Weigh, to the nearest 0,000 1 g, approximately 2 g of pre-equilibrated test sample (6.2) directly into the dried and tared weighing bottle (7.2). Record the mass ( $m_2$ ). Also at this stage weigh test portions required for the determination of constituents for which correction of the analytical values to a dry basis is required (e.g. loss of mass at 1 075 °C and aluminium content) and transfer such test portions to the vessels specified.

### 7.4 Determination

Transfer the uncovered bottle with its lid to the laboratory oven and dry at  $105 \pm 2$  °C for 1 h. Close the bottle, allow to cool in the desiccator for 30 to 45 min and re-weigh after slightly lifting the lid and quickly replacing it.

NOTE — Where a heat sink has been used in the desiccator, a 10 min cooling time will be sufficient.

Repeat the drying at 105 °C for 30 min, cooling in a desiccator for 30 to 45 min, and weighing steps for as many times as necessary to achieve constant mass in the test portion, i.e. until the difference between two successive weighings does not exceed 0,02 %. Record the constant mass ( $m_3$ ).

## 8 Expression of results

The hygroscopic moisture content  $H$ , expressed as a percentage by mass as water ( $H_2O$ ), is given by the formula

$$\frac{m_2 - m_3}{m_2 - m_1} \times 100$$

where

$m_1$  is the mass, in grams, of the weighing bottle;

$m_2$  is the mass, in grams, of the weighing bottle with ore before drying;

$m_3$  is the mass, in grams, of the weighing bottle with ore after drying.

Take as the final result the mean of the duplicate determinations.

## 9 Test report

The test report shall include the following information:

- a) details necessary for the identification of the sample;
- b) reference to this International Standard;
- c) results of the analysis;
- d) reference number of the results;
- e) any characteristics noticed during the determination and any operations not specified in this International Standard or in the International Standard to which reference is made which may have had an influence on the results.

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