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# International Standard



# 2596

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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

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## Iron ores — Determination of hygroscopic moisture in analytical samples

*Minerais de fer — Détermination de l'humidité des échantillons pour analyse*

Second edition — 1980-06-15

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

International Standard ISO 2596 was developed by Technical Committee ISO/TC 102, *Iron ores*.

This second edition was submitted directly to the ISO Council, in accordance with clause 5.10.1 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 2596-1973), which had been approved by the member bodies of the following countries:

Australia	India	Spain
Belgium	Italy	Sweden
Canada	Japan	Turkey
Czechoslovakia	Poland	United Kingdom
Egypt, Arab Rep. of	Portugal	USA
France	Romania	USSR
Germany, F.R.	South Africa, Rep. of	

The member body of the following country had expressed disapproval of the document on technical grounds:

Netherlands.

# Iron ores — Determination of hygroscopic moisture in analytical samples

## 1 Scope and field of application

This International Standard specifies a method for the determination of hygroscopic moisture in analytical samples of iron ores.

This method is applicable to natural iron ores, iron ore concentrates, and agglomerates including sinter products.

### 1.1 Special case

Determination of hygroscopic moisture in analytical samples containing pyrrhotite. (See clause 8.)

## 2 References

ISO 3081, *Iron ores — Increment sampling — Manual method*.

ISO 3083, *Iron ores — Preparation of samples — Manual method*.

## 3 Principle

Drying of the test portion in air at about 105 °C to constant mass. (See also clause 8.)

## 4 Apparatus

Ordinary laboratory apparatus.

## 5 Sampling and samples

For analysis, a laboratory sample of minus 100 µm particle size

which has been taken in accordance with ISO 3081<sup>1)</sup> and prepared in accordance with ISO 3083<sup>1)</sup> shall be used. In the case of ores with high contents of combined water and/or oxidizable compounds, the particle size shall be minus 160 µm.

## 6 Procedure

### 6.1 Number of analyses

The determination of hygroscopic moisture shall be carried out on two 10 g test portions of the air-dried laboratory sample, simultaneously with the taking of test portions for the determination of other constituents.

### 6.2 Test portion

Weigh, to the nearest 0,000 2 g, 10,000 0 g of the test sample (air-dried under laboratory conditions).

### 6.3 Determination

Place the test portion in a weighing bottle previously dried at a temperature of 105 ± 2 °C and weighed together with the stopper. Dry the test portion in an oven at 105 ± 2 °C. After 2 h, close the the bottle with the stopper, cool it in a dessicator for 20 to 30 min and then reweigh. Just before weighing, slightly open the stopper, then quickly close it again. Repeat the drying several times for 25 min each, until constant mass is obtained.

If, after repeated drying, the test portion increases in mass then accept as final the mass preceding the increase. The difference in the mass of the stoppered bottle with the ore before and after drying shall be accepted as the mass of hygroscopic moisture, in grams, in the test portion.

1) A further International Standard now in preparation (ISO 3082) will specify mechanical methods of increment sampling and will also specify methods of sample preparation.

## 7 Expression of the results

### 7.1 Calculation of hygroscopic moisture

The content of hygroscopic moisture  $A$ , expressed as a percentage by mass, is given by the formula :

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

where

$m_1$  is the mass, in grams, of the bottle with ore before drying;

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

$m_3$  is the mass, in grams, of the test portion.

### 7.2 General treatment of results

The arithmetic mean of the two results calculated as a percentage by mass as specified in 7.1 shall be accepted as the final result. The difference between the results shall not exceed the permissible tolerance given in 7.3.

### 7.3 Permissible tolerances

The permissible tolerances, per cent (absolute value), are given in the table.

Table — Permissible tolerances

Hygroscopic moisture content	Permissible tolerance (in absolute value)
%	%
0,1 up to 0,5	0,04
0,5 up to 1,0	0,08
1,0 up to 2,0	0,20
over 2,0	0,40

## 8 Special case

If the iron ore contains pyrrhotite, the test portion is to be dried at  $80 \pm 2$  °C instead of  $105 \pm 2$  °C.

## 9 Test report

The test report shall include the following information :

- reference to this International Standard;
- details necessary for the identification of the sample;
- results of the analysis;
- reference number of the results;
- any characteristics noticed during the determination, and any operations not specified in this International Standard which may have had an influence on the results.

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