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Iron ores — Sampling and sample preparation procedures

Minerais de fer — Procédures d'échantillonnage et de préparation des échantillons

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 102, *Iron ore and direct reduced iron*, Subcommittee SC 1, *Sampling*.

This fifth edition cancels and replaces the fourth edition (ISO 3082:2009), which has been technically revised. It also incorporates the Technical Corrigendum ISO 3082:2009/Cor.1:2009. The main changes compared to the previous edition are as follows:

— expansion of the definition of test sample;

— insertion of a new paragraph in 4.1 indicating that sampling from the top of a moving conveyor belt using cross-belt (hammer) samplers is not permitted;

— deletion of reference to increasing the cutter aperture above three times nominal top size to avoid bridging of the cutter lips for wet sticky ore at the end of 5.1.4.2;

— expression of bulk density in kg/m^3 in 5.1.4.4 and corresponding amendment of Formula (3);

— insertion of an explanation in the first paragraph of 5.2 that better precision means a lower value of β_{SPM};

— inclusion of an extra column in Table 1 and extra rows in Tables 3 and 5 for mass of lot over 340 000 tonnes and updating of the overall precision values for phosphorus content in Table 1 based on international data collected on precisions achieved in practice;

— updating of the sampling precision values for phosphorus content in Table 3 based on international data collected on precisions achieved in practice as well as minor adjustments to the sizing precisions for sized ore and sinter feed;

— changing of "there will not be any oversize material remaining" in 7.7.2 to "no more than 5 % by mass oversize material is retained on the relevant sieve";

— changing of "sample division" to "division" throughout 10.1.5;

— clarification of the requirements for preparation of test samples for moisture determination and division of individual increments or partial samples in 10.1.6.1.1, 10.1.6.1.2 and 10.1.6.2.3;

— correction of the mass of sample for physical testing to 600 kg in the last sentence of 10.1.6.3;

— major revision of 10.2.4 to clarify the special procedure for moisture content, including a revision of Table 7;

— insertion of a new clause (10.4.3) describing the manual strip-division method as an acceptable alternative to manual increment division and riffle division;

— amendment of all particle size specifications in 10.5 to nominal top size, including Figure 11 and Figure 12;

— significant revision of 10.6 to clarify the procedure for preparation of test samples for moisture determination.

Iron ores — Sampling and sample preparation procedures

WARNING — This document can involve hazardous materials, operations and equipment, and does not purport to address all the safety issues associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices.

1 Scope

This document provides

a) the underlying theory,

b) the basic principles for sampling and preparation of samples, and

c) the basic requirements for the design, installation and operation of sampling systems

for mechanical sampling, manual sampling and preparation of samples taken from a lot under transfer. This is in order to determine the chemical composition, moisture content, size distribution and other physical and metallurgical properties of the lot, except bulk density obtained using ISO 3852 (Method 2).

The methods specified in this document are applicable to both the loading and discharging of a lot by means of belt conveyors and other ore-handling equipment to which a mechanical sampler can be installed or where manual sampling can safely be conducted.

The methods are applicable to all iron ores, whether natural or processed (e.g. concentrates and agglomerates, such as pellets or sinters).

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 3084, *Iron ores — Experimental methods for evaluation of quality variation*

ISO 3085, *Iron ores — Experimental methods for checking the precision of sampling, sample preparation and measurement*

ISO 3086, *Iron ores — Experimental methods for checking the bias of sampling*

ISO 3087, *Iron ores — Determination of the moisture content of a lot*

ISO 3271, *Iron ores for blast furnace and direct reduction feedstocks — Determination of the tumble and abrasion indices*

ISO 3310-1, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth*

ISO 3310-2, *Test sieves — Technical requirements and testing — Part 2: Test sieves of perforated metal plate*

ISO 3852, *Iron ores for blast furnace and direct reduction feedstocks — Determination of bulk density*

ISO 4695, *Iron ores for blast furnace feedstocks — Determination of the reducibility by the rate of reduction index*