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Iron ores for blast furnace feedstocks — Determination of low-temperature reduction-disintegration indices by dynamic method

Minerais de fer pour charges de hauts fourneaux — Détermination des indices de désintégration par réduction à basse température, par méthode dynamique

Reference number
ISO 13930:2015(E)

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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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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 102, *Iron ore and direct reduced iron*, Subcommittee SC 3, *Physical testing*.

This third edition cancels and replaces the second edition (ISO 13930:2007), of which it constitutes a minor revision to contemplate the care needed during hand sieving, to introduce the mechanical sieving and to exclude the reference to ISO 4701.

This corrected version of ISO 13930:2015 incorporates the following corrections:

— in 7.2.1, CH_4 has been replaced by N_2.

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Introduction

This International Standard concerns one of a number of physical test methods that have been developed to measure various physical parameters and to evaluate the behaviour of iron ores, including reducibility, disintegration, crushing strength, apparent density, etc. This method was developed to provide a uniform procedure, validated by collaborative testing, to facilitate comparisons of tests made in different laboratories.

The results of this test have to be considered in conjunction with other tests used to evaluate the quality of iron ores as feedstocks for blast furnace processes.

This International Standard can be used to provide test results as part of a production quality control system, as a basis of a contract, or as part of a research project.

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Iron ores for blast furnace feedstocks — Determination of low-temperature reduction-disintegration indices by dynamic method

CAUTION — This International Standard may involve hazardous operations and equipment. This International Standard does not purport to address all of the safety issues associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to its use.

1 Scope

This International Standard specifies a method to provide a relative measure for evaluating the degree of size degradation of iron ores when reduced under conditions resembling those prevailing in the low-temperature reduction zone of the blast furnace.

This International Standard is applicable to lump ores and hot-bonded pellets.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3082, *Iron ores — Sampling and sample preparation procedures*

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 11323, *Iron ore and direct reduced iron — Vocabulary*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 11323 apply.

4 Principle

The test portion is isothermally reduced in a rotating tube bed, at 500 °C, using a reducing gas consisting of CO, CO_2, H_2 and N_2, for 60 min. The reduced product is sieved with sieves having square openings of 6,30 mm, 3,15 mm and 500 µm. Three low-temperature reduction-disintegration indices (LTD) are calculated as the mass percentage of material greater than 6,30 mm, less than 3,15 mm and less than 500 µm.

5 Sampling, sample preparation and preparation of test portions

5.1 Sampling and sample preparation

Sampling of a lot and preparation of a test sample shall be in accordance with ISO 3082.

The size ranges for pellets shall be either – 16,0 mm + 12,5 mm or – 12,5 mm + 10,0 mm.

The size ranges for lump ores shall be – 12,5 mm + 10,0 mm.

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