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Carbonaceous materials for use in the production of aluminium — Calcined coke — Determination of grain stability using a laboratory vibration mill

Produits carbonés utilisés pour la production de l'aluminium — Coke calciné — Détermination de la stabilité du grain par broyeur à billes oscillant

Reference number
ISO 10142:1996(E)

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.

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.

International Standard ISO 10142 was prepared by Technical Committee ISO/TC 47, *Chemistry*, Subcommittee SC 7, *Aluminium oxide, cryolite, aluminium fluoride, sodium fluoride, carbonaceous products for the aluminium industry*.

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Carbonaceous materials for use in the production of aluminium — Calcined coke — Determination of grain stability using a laboratory vibration mill

1 Scope

Calcined coke with poor mechanical strength may become degraded during mixing. Poor grain stability will affect the grain size and may result in poor quality of baked blocks.

This International Standard describes a laboratory vibration mill method for the determination of the grain stability of calcined coke for the manufacture of carbon products used in the manufacture of aluminium.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this International Standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this International Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 3310-1:1990, *Test sieves — Technical requirements and testing — Part 1: Test sieves of metal wire cloth.*

ISO 6375:1980, *Carbonaceous materials for the production of aluminium — Coke for electrodes — Sampling.*

3 Principle

The 4 mm to 8 mm fraction of a sample of calcined coke is subjected to the grinding action of a laboratory vibration mill and the percentage residue retained on a specified sieve screen is measured.

4 Apparatus

4.1 Laboratory vibration mill, having two grinding vessels, each filled with 1 kg of clean, hard steel balls, diameter 10 mm ± 0,4 mm. The main features of the mill are shown in figures 1 to 5.

The mill (1) and drive motor (9) are mounted on a common base plate (2). The grinding vessels (7, 8) are installed in the body of the mill, which is supported by four soft, flat springs (4). The spring suspension system is designed to allow the machine to be operated without any fastenings or anchorage. The grinding vessels are secured by adjustable straps (5) which have a quick-release catch (13). The oscillator is supported on a bearing (6), fitted to the body of the mill, and is driven by the motor (9) via a special clutch (3) and a hollow flexible shaft (12).

The peak-to-peak amplitude of the vibration shall be 4 mm ± 0,5 mm. A reference disc is fitted to the front of the machine to measure the amplitude of vibration.

The motor shall be capable of 1 450 rpm to 1 470 rpm. The bearing housing (11) is rigidly connected to the bearings (6). The shaft (12) rotates inside the bearings with two steel imbalance discs (10) attached and is connected to the motor via the clutch (3). The imbalance discs are shown in figure 4.

The imbalance discs rotate eccentrically and the entire oscillating mass follows with a phase lag of 180°, supported by the springs.

Each grinding vessel (see figure 5) has a total volume of 1 litre and an effective volume of 0,3 litres. It is closed by a lid (15) with a rubber sealing ring (16). The lid is held in place by a clamp (17) fitted with a wing nut (18).

The electric motor is linked to a timer switch having a precision of ±2 s.

Dimensions in millimetres

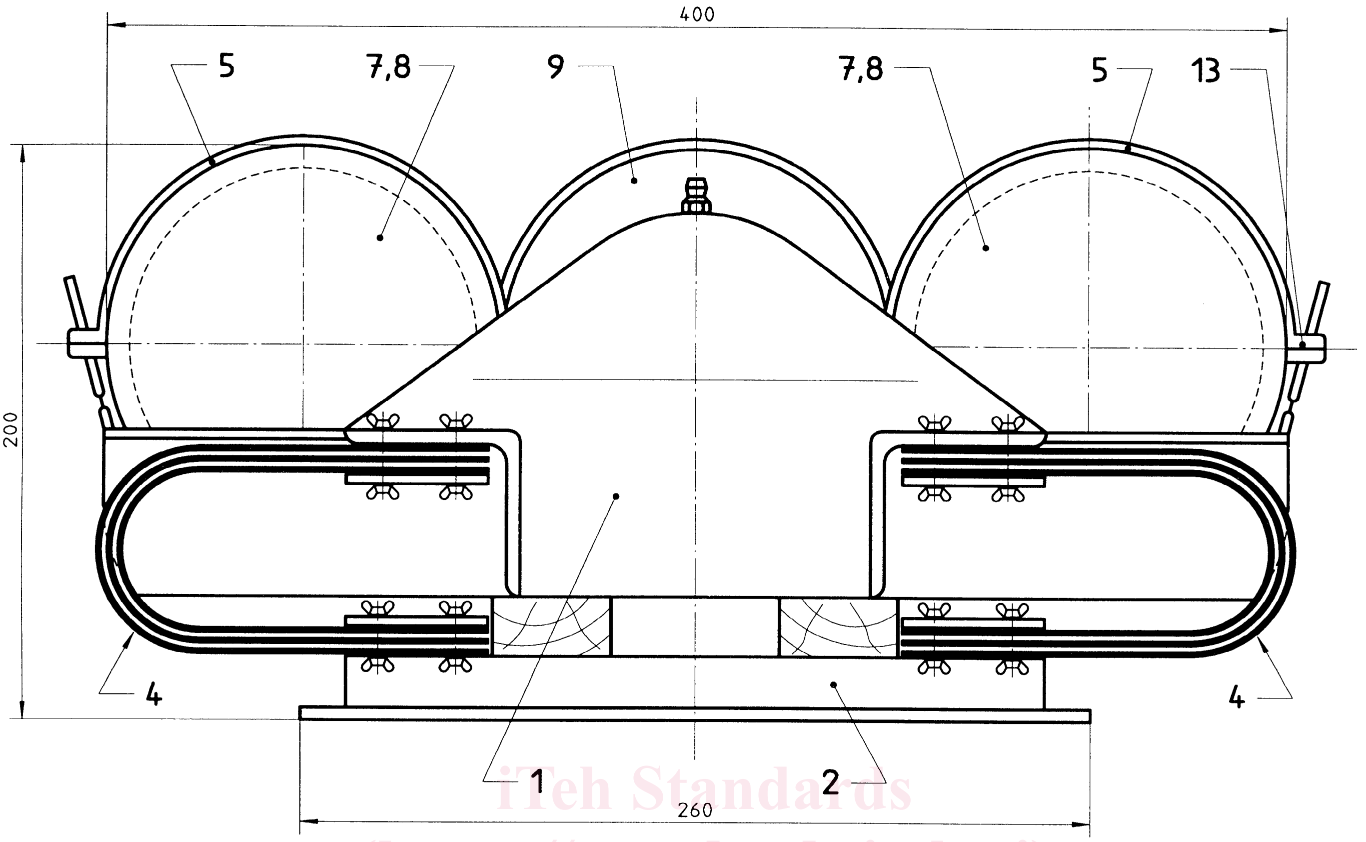

Figure 1 — Laboratory vibration mill — Front view

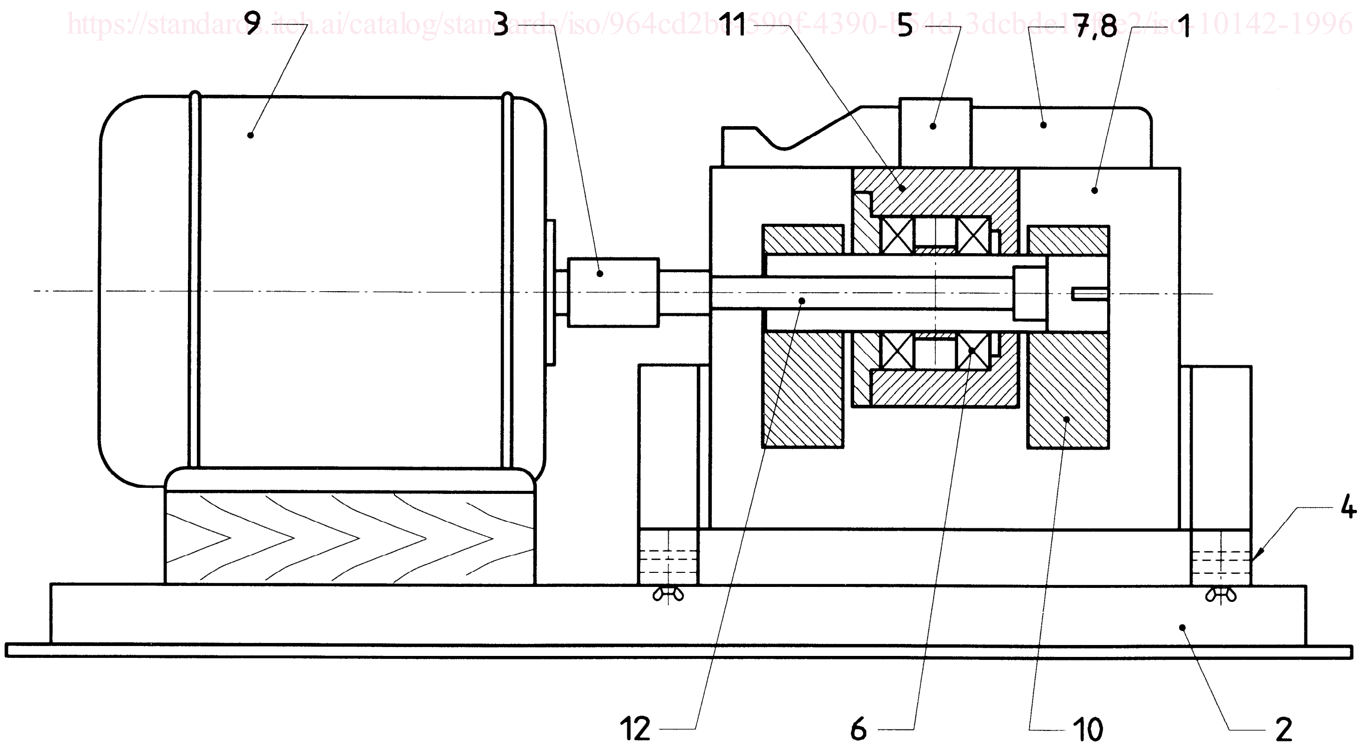

Figure 2 — Laboratory vibration mill — Side view