INTERNATIONAL STANDARD 2926

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Aluminium oxide primarily used for the production of aluminium — Particle size analysis — Sieving method

Oxyde d'aluminium principalement utilisé pour la production de l'aluminium — Analyse granulométrique — Méthode par tamisage

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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 2926 was drawn up by Technical Committee ISO/TC 47, *Chemistry*, and circulated to the Member Bodies in September 1972.

It has been approved by the Member Bodies of the following countries :

Austria	Israel	Sweden
Belgium	Italy	Switzerland
Czechoslovakia	Netherlands	Thailand
Egypt, Arab Rep. of	Poland	Turkey
France	Portugal	United Kingdom
Germany	Romania	U.S.S.R.
Hungary	South Africa, Rep. of	
India	Spain	

This International Standard has also been approved by the International Union of Pure and Applied Chemistry (IUPAC).

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Canada
New Zealand

Aluminium oxide primarily used for the production of aluminium — Particle size analysis — Sieving method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for determining the mass distribution of the particle sizes of diameter 50 μm or larger in aluminium oxide for industrial use.

2 REFERENCES

ISO/R 802, *Aluminium oxide primarily used for the production of aluminium — Preparation and storage of test samples.*

ISO 3310/I, *Test sieves — Technical requirements and testing — Part I : Metal wire cloth.* [1]

3 PRINCIPLE

Mechanical sieving of a test portion of the crude sample, dried at 100 °C, through woven wire sieves in an atmosphere of relative humidity not greater than 50 %.

Weighing of each of the separate fractions. Verification, by means of a lens or microscope, of the degree of obstruction of the sieve meshes (maximum permitted obstruction : 1 %).

4 APPARATUS

Ordinary laboratory apparatus and

4.1 Test sieves, each including a sieving medium and a frame.

The media are constructed of smooth, single metal wires in the form of woven wire cloth. Each warp wire passes alternately above and below each weft wire, and vice versa. The openings between the wires form evenly spaced apertures of uniform size and shape.

NOTE – Any other method of weaving the cloth for the media, especially twilled weave where every warp wire passes alternately above and below consecutive pairs of weft wires and vice versa, is to be avoided.

The sieve apertures shall have the following nominal sizes : 250 – 200 – 160 – 125 – 100 – 80 – 63 – 50 μm.

These values are taken from the R 20 series of ISO 3310/I.

The diameters of the wires and the tolerances shall be as specified in ISO 3310/I.

NOTE – By agreement between the interested parties the sieve aperture sizes may be those of the standardized series in individual countries having values as close as possible to those given above.

The frames shall be cylindrical, with diameters as close as possible to 200 mm and heights between 50 and 75 mm. It shall be possible to fit the sieves together tightly to form a series of test sieves. A lid and a bottom receiver shall be included.

4.2 Mechanical shaker, including a means of fixing the sieves, mounted inside each other, as a tight series unit with the receiver as the final stage, and an eccentric feeder motor, imparting small, low-frequency, jerky movements to the sieve assembly. It is recommended that shakers be used only after a check to ensure that the movements imparted to the sieve cause sufficient displacement of the aluminium oxide particles to be sieved to prevent aggregations, but do not cause any deformation of the mesh wires by vibration or any size reduction of the aluminium oxide particles through shock or abrasion. A frequency of 50 shocks per second with an amplitude of 1 to 4 mm is recommended.

5 PROCEDURE

5.1 Test portion

Weigh, to the nearest 0,001 g, 50 ± 0,1 g of the crude sample, prepared according to the instruction in 2.2 of ISO/R 802, previously dried at 100 °C for 2 h and cooled to ambient temperature in an atmosphere of relative humidity not greater than 50 %.

5.2 Determination

Assemble the sieves (4.1) on the mechanical shaker (4.2) in increasing order of aperture size from bottom to top, starting with the bottom receiver.

Spread the test portion (5.1) on the bottom of the topmost sieve. Close with the tight lid.

1) At present at the stage of draft.

Switch on the mechanical shaker (4.2) and operate for 30 min. Stop the shaker, unstack the sieves and, using a hard hair brush, transfer the aluminium oxide remaining on each sieve to a tared container. This operation must be carried out in an atmosphere of relative humidity not greater than 50 %.

In the same way, transfer the aluminium oxide which has passed through the last sieve and collected in the bottom receiver.

Weigh each of the separate fractions to the nearest 0,1 g (masses m_1). Note the mass of each fraction and the sieve size on which it was retained.

Carry out a visual check, with a lens or microscope, to ensure that not more than 1 % of the sieve mesh is obstructed by aluminium oxide particles. In the contrary case, repeat the determination in full.

6 EXPRESSION OF RESULTS

Divide the masses, designated by m_1, by the mass of the test portion (5.1), designated by m_0, and reduce to percentages :

$$m_2 = \frac{m_1}{m_0} \times 100$$

Prepare a table of values of m_2 corresponding to each successive aperture size and calculate the cumulative m_2 values corresponding to each aperture size as a percentage retained.

The final m_2 value, corresponding to the mass of aluminium oxide which has passed through the bottom sieve, is not included in the cumulative result and is expressed as passing through the final sieve aperture.

Check that the sum of all the values of m_2, including the mass passing through the bottom sieve, does not deviate from 100 % by more than 2 %.

Plot a cumulative distribution curve of the mass passing through each sieve, expressed as a percentage, against the corresponding aperture size in decreasing order of aperture size.

7 TEST REPORT

The test report shall include the following particulars :

a) the reference of the method used;

b) the results and the method of expression used;

c) any unusual features noted during the determination;

d) any operation not included in this International Standard or the documents to which reference is made, or regarded as optional.