INTERNATIONAL STANDARD

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Aluminium ores — Experimental determination of the heterogeneity of distribution of a lot

Minerais alumineux — Détermination expérimentale de l'hétérogénéité de distribution d'un lot

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 6139 was prepared by Technical Committee ISO/TC 129, *Aluminium ores*, Sub-Committee SC 1, *Sampling*.

Aluminium ores — Experimental determination of the heterogeneity of distribution of a lot

1 Scope

This International Standard specifies experimental methods for evaluating the heterogeneity of distribution of aluminium ores, for the purpose of determining the minimum number of primary increments and consequently the sampling scheme.

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 8685:1992, *Aluminium ores — Sampling procedures.*

ISO 10277:—[1], *Aluminium ores — Experimental methods for checking the precision of sampling.*

3 General

3.1 Origin of heterogeneity of distribution

The heterogeneity of distribution is a measure of the distribution variability of the aluminium ore and hence the manner in which the particles are distributed throughout the lot. It depends on the natural variability of the aluminium ore being mined, how well it is blended, and how it is subsequently handled. It can be reduced by mixing, but it can never be completely eliminated. Unlike the heterogeneity of constitution, the heterogenity of distribution is not a function of sample mass. Its contribution to the sampling variance can be reduced only by increasing the number of increments.

3.2 Method of estimating the heterogeneity of distribution

The heterogeneity of distribution, characterized by the distribution variance, is determined by experimentally measuring the sampling variance. However, because both the composition variance (V_c) and distribution variance (V_D) contribute to the measured sampling variance, it is necessary to separate these two components. This is achieved by measuring the sampling variance at two different increment masses.

Two methods of data analysis are permitted. The first (see 5.1) is based on Visman's theory of sampling which uses classical statistics. This method gives conservative estimates of the sampling variance and hence the distribution variance. The second method (see 5.2) is based on the variogram which takes into account serial correlation between adjacent increments and the spacing between increments. It gives a better estimate of the sampling variance and should be used to optimize the sampling scheme.

In both cases, the variance of sample preparation and analysis shall be determined separately in accordance with ISO 10277, and subtracted from the measured variances.

3.3 Characteristics measured

The quality characteristics chosen for measuring the heterogeneity of distribution should be those that are most relevant to the sampling operation. For aluminium ores these could be

— aluminium content, expressed as a percentage by mass of Al_2O_3;

— silicon content, expressed as a percentage by mass of SiO_2;

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1) To be published.