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Solid fertilizers — Reduction of samples

Matières fertilisantes solides — Réduction des échantillons

Reference number
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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

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. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7742 was prepared by Technical Committee ISO/TC 134, *Fertilizers and soil conditioners.*

Annex A forms an integral part of this International Standard. Annex B is for information only.

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Solid fertilizers — Reduction of samples

1 Scope

This International Standard specifies a method suitable for the reduction of a sample of a solid fertilizer to a smaller quantity such as may be used for analysis or for further reduction after suitable comminution.

By choosing suitable equipment, the method is applicable to the reduction of a sample of any mass above a minimum defined by the size and number of particles. The method can be applied to the division of samples into a number of equally representative sub-samples.

Other reduction devices and methods are described in annex A but they are not as accurate as the recommended procedure.

This International Standard does not include information on the methods of obtaining the original sample.

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 listed below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO/TR 7553 : 1987, *Fertilizers — Sampling — Minimum mass of increment to be taken to be representative of the total sampling unit.*

ISO 8397 : 1988, *Solid fertilizers and soil conditioners — Test sieving.*

3 Principle

Passage of the material through a rotating sample divider; collection of the fractions, followed by rejection or recombination of some of the fractions.

4 Apparatus

4.1 Basic requirements

Rotating sample dividers are of several basic types. They may operate by collecting increments from a falling stream (cutter type) or by extracting a helical ribbon from a falling cylindrical curtain, such as is created by allowing the fertilizer to fall on to the apex of a cone distributor. In the case of the cutter type, each increment shall consist of a complete cross-section of the stream.

All sample dividers shall conform to the following basic requirements:

a) The effective opening of the cutter or slot shall be at least three times, but preferably five times, the maximum particle size of the fertilizer to be divided. In practice, this means a minimum dimension of at least 15 mm.

b) The divider shall be constructed and operated in such a manner that every particle has an equal opportunity of being included in the sub-sample. Provided that all parts of the stream are sampled in due proportion, an unbiased sample should be obtained.

c) At least 50 to 60 increments shall be taken from the gross sample at each stage of division.

4.2 Test for bias

The sample divider is considered acceptable for a certain type of fertilizer only after it has been installed and has been shown to comply with the test requirements for bias and precision. The tests should be based on the particle size distribution of the fertilizer (see ISO 8397) as this is likely to be the property most sensitive to bias. Thus, it is likely that errors in chemical analysis may themselves arise from errors in the particle size distribution of the fertilizer. At least three sieves should be used in the particle size analysis, giving at least four different fractions, none of which should contain less than 5 % or more than 40 % of the total.

The particle size distribution of two analysis samples collected from each of ten gross samples from the same fertilizer is obtained by sieving through at least three sieves. The mean difference between the percentages retained on the smallest of the sieves used is calculated and used to estimate the errors of sample division. To provide an unbiased estimate, the two analysis samples shall be as independent as possible. To do this, two separate samples shall be obtained at the one stage of division, if necessary by sampling the discarded material.

The estimation of the errors of sample division is itself liable to error. The most satisfactory procedure is therefore to test the results to ensure that the errors are not greater than permitted. For example, if the mean difference between ten duplicate preparations is $|\bar{d}|$ and S_d^2 is the estimated variance of the set of ten differences, $|\bar{d}|$ must be smaller than 0,72 S_d. If two successive sets of ten duplicate preparations satisfy this condition, it may be assumed that the division is satisfactory.