INTERNATIONAL STANDARD

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Pulps — Determination of stock concentration

Pâtes — Détermination de la concentration en pâte

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Foreword

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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 4119 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*, Subcommittee SC 5, *Test methods and quality specifications for pulp*.

This second edition cancels and replaces the first edition (ISO 4119:1978), of which it constitutes a technical revision.

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Pulps — Determination of stock concentration

1 Scope

This International Standard specifies a method for determining the stock concentration of aqueous pulp suspensions. It is used in laboratory procedures for the determination of other pulp properties and is referred to in a range of other ISO standards where pulp suspensions are involved. It is not intended for determining the saleable mass of slush pulps.

In principle, this method is applicable to all kinds of aqueous pulp suspensions.

2 Definitions

For the purposes of this International Standard, the following definitions apply.

2.1 stock: Aqueous suspension of one or more pulps, which may contain fillers and additives.

2.2 stock concentration: Ratio of the oven-dry mass of material that can be filtered from a stock sample, to the mass of unfiltered sample, when determined as specified in this International Standard.

NOTE 1 In this International Standard, the stock concentration is expressed as a percentage by mass [% (*m/m*)].

3 Apparatus

Ordinary laboratory apparatus and

3.1 Weighing containers, of sufficient size for weighing the stock sample or the filter (see clause 5, note 4).

3.2 Balance, capable of weighing a mass of 100 g to 500 g with an error of less than 0,1 %.

3.3 Filtering device, such as a Büchner funnel, of diameter 90 mm to 150 mm, a large filtering flask, and circular filter paper to fit the funnel; the paper shall be such that all visible fibre and inorganic material will be retained.

3.4 Means for drying the sample, for example suitable drying oven or hotplate. The temperature of the drying oven shall be 105 °C ± 2 °C and that of the hotplate 150 °C ± 15 °C.

NOTES

2 A microwave oven may optionally be used if the operating conditions (power setting and drying time) are experimentally determined to produce the same drying effect on pulp as produced by a normal drying oven. Incorrect operating conditions may cause charring of the sample.

3 A temperature of 150 °C for the hotplate may be too high for some pulps and cause charring of the sample.

3.5 Balance, capable of weighing the dried mat of fibres with an error of less than 0,1 %.

4 Sampling and sample preparation

4.1 General

Mix the stock thoroughly, and stir it while the sample is being taken. Samples shall be removed with a suitable vessel by a scooping action, to minimize the separation of fibres from the water. The entire sample may be obtained in one dipping action, or several smaller samples may be combined, but all of the stock removed shall be included in the sample to be weighed. Incorrect sampling techniques can introduce significant errors at higher concentrations. Take samples for two determinations, or as many as are indicated in the test method for which the determination of stock concentration is being made.

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4.2 Stock concentrations less than 0,3 % (*m/m*)

Take a sample of at least 500 g (500 ml), and sufficient to ensure a mass of oven-dry fibre of between 1 g and 5 g. Weigh the sample in a tared container (3.1) and determine the net mass (m_1) with an error of less than 0,5 g, using the balance (3.2).

4.3 Stock concentration between 0,3 % (*m/m*) and 1 % (*m/m*)

Take a sample of approximately 500 g, pour it into a tared container (3.1) and determine the net mass (m_1) with an error of less than 0,5 g, using the balance (3.2).

4.4 Stock concentration more than 1 % (*m/m*)

Take a sample of approximately 500 g, pour it into a tared container (3.1) and determine the net mass (m_1) with an error of less than 0,5 g, using the balance (3.2). Dilute with water, the mass of which (m_2) is known with an error of less than 0,5 %, to give a stock concentration of less than 1 %. Mix thoroughly, take an aliquot of about 500 g, pour into a tared container (3.1) and determine the mass (m_3) of the aliquot.

5 Procedure

Dry a filter paper (3.3) in a drying oven or on a hotplate (3.4) at the appropriate temperature to constant mass. Weigh it immediately and record the mass (m_4). Carry out all weighings to the nearest 0,01 g. The filter paper is considered as having reached constant mass when two consecutive weighings do not differ by more than 0,01 g. In all cases the drying period between two consecutive weighings shall be no longer than necessary, but at least one-fourth of the total drying time previously applied.

NOTE 4 Weighing of the dried filter paper can also be carried out after cooling in a tared container (3.1).

Place the filter paper in the Büchner funnel (see 3.3), and wet it. Apply suction and filter the stock sample (see clause 4) contained in the measuring cylinder or a tared container (3.1), rinse the inner walls of the cylinder or container, and add the rinsings to the funnel. Make sure that the filtrate is clear and, if not, filter again through the same filter, or run another test, with a denser filter paper. Wash the mat of fibres with successive small quantities of distilled or deionized water. Remove the filter paper and the mat of fibres carefully from the funnel, taking care that all the solid matter from the funnel walls is included. Dry and weigh the mat of fibres and the filter paper as specified above, using the same procedure as when drying and weighing the filter paper. Record the mass (m_5).

6 Expression of results

The stock concentration X, expressed as a percentage by mass, is given by the formula

$$X = \frac{m_5 - m_4}{m_1} \times 100$$

where

m_1 is the mass, in grams, of the initial sample taken;

m_4 is the dry mass, in grams, of the filter paper;

m_5 is the dry mass, in grams, of the fibre mat and filter paper.

If the sample has been prepared according to 4.4, the stock concentration is given by the formula

$$X = \frac{m_5 - m_4}{m_1} \times \frac{m_1 + m_2}{m_3} \times 100$$

where

m_1 is the mass, in grams, of the initial sample taken;

m_2 is the amount of water added to dilute the initial sample taken, in grams;

m_3 is the mass of the aliquot taken, in grams;

m_4 is the dry mass, in grams, of the filter paper;

m_5 is the dry mass, in grams, of the fibre mat and filter paper.

Report the result as the mean of the determinations to two decimal places.

7 Test report

The test report shall include the following information:

a) reference to this International Standard;

b) all the information necessary for complete identification of the sample;

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c) the stock concentration, expressed as a percentage by mass;

d) any unusual features observed in the course of the test;

e) any operations not specified in this International Standard, which might have affected the results.

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