
International Standard



5263

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Pulps — Laboratory wet disintegration

Pâtes — Désintégration humide de laboratoire

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FOREWORD

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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 5263 was developed by Technical Committee ISO/TC 6, *Paper, board and pulps*, and was circulated to the member bodies in November 1977.

It has been approved by the member bodies of the following countries :

Austria	Hungary	Poland
Belgium	India	Romania
Canada	Iran	South Africa, Rep. of
Chile	Ireland	Spain
Czechoslovakia	Israel	Switzerland
Egypt, Arab Rep. of	Italy	Turkey
Finland	Kenya	USA
France	Mexico	USSR
Germany, F. R.	Netherlands	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

Bulgaria
United Kingdom

Pulps — Laboratory wet disintegration

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies a method for the disintegration of pulp in a laboratory wet disintegrator. This disintegration procedure does not apply to disintegration as a preliminary step for laboratory beating of pulp in accordance with ISO 5264.

In principle this method is applicable to most kinds of pulp. It is not suitable for some very long-fibred pulps, such as those from unshortened cotton, flax and similar materials.

2 REFERENCES

ISO 638, *Pulps — Determination of dry matter content*.

ISO 4119, *Pulps — Determination of stock concentration*.¹⁾

3 DEFINITION

disintegration of a pulp sample : Subjection to mechanical treatment in water so that interlaced fibres, which were free in the pulp stock, are again separated from one other without appreciably changing their structural properties.

4 APPARATUS

Ordinary laboratory apparatus and

4.1 Disintegrator, as described in annex A.

Details for checking the disintegrator are given in annex B.

4.2 Balance, capable of weighing the sample with an accuracy of $\pm 0,2$ g.

5 PREPARATION OF SAMPLE

If the pulp is wet or air-dry, weigh out a sample for dry matter determination in accordance with ISO 638. If the pulp is in slush form, determine the dry matter content in accordance with ISO 4119.

Take a mass of the pulp prescribed in the table. Do not cut the pulp and avoid using cut edges. Pulps having an oven-dry fibre content equal to or greater than 20 % (m/m) shall be soaked in 1 to 1,5 litre of distilled water at 20 ± 5 °C (see notes 1 and 2) for the time prescribed in the table (see note 3). If the pulp is in the form

of sheets or slabs, tear the soaked pulp into pieces of dimensions approximately 25 mm x 25 mm.

NOTES

1 Distilled water or water of similar quality is particularly recommended with a view to obviating any difficulties that might arise from the use of different qualities of water by the interested parties.

2 Where necessary for climatic reasons, a temperature of 25 ± 5 °C may be applied, provided that this is noted in the test report.

3 Except with some flash-dried mechanical pulps, soaking for a longer time than specified, for example overnight, has not been found to have any significant effect on the results.

TABLE — Summary of the disintegration conditions

Kind of pulp	Mass of pulp g	Soaking time	Disintegration volume ml	Number of revolutions (see note)
Chemical	24	4 h	2 000	75 000
Flash-dried chemical	60	4 h	2 700	30 000
Mechanical	60	4 h	2 700	30 000
Flash-dried mechanical	60	10 min	2 700	30 000

NOTE — Pulps having a dry matter content of less than 20 % (m/m) shall be disintegrated for 10 000 revolutions.

6 PROCEDURE

Transfer the sample into the container of the disintegrator (4.1). Add water at 20 ± 5 °C (see notes 1 and 2 to clause 5) to give the total volume prescribed in the table. Set the revolution counter to zero. Switch the motor on and allow the disintegrator to run for a few seconds. Switch the motor off and before the propeller stops, switch on again. Allow the propeller to make the number of revolutions prescribed in the table. Stop the propeller and check that the pulp is completely disintegrated. If it is not, the disintegration may be continued but the results obtained shall not be considered as complying with this International Standard.

NOTES

1 If for any special reason a different number of revolutions is used, this shall be noted in the test report.

2 After disintegration, clean the disintegrator thoroughly with water and, if necessary, with a pitch solvent.

1) At present at the stage of draft.

7 TEST REPORT

The test report shall include the following particulars :

- a) reference to this International Standard;
- b) all the indications necessary for complete identification of the sample;
- c) the soaking time;
- d) the pulp concentration and the number of revolutions used;
- e) any unusual features observed in the course of the procedure;
- f) any operations not specified in this International Standard or regarded as optional, which might have affected the results.

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ANNEX A

CONSTRUCTION OF THE DISINTEGRATOR

(This annex forms part of the standard.)

A.1 MATERIALS

All components that come into contact with pulp suspensions shall be resistant to water and to dilute acids and alkalis.

A.2 DISINTEGRATOR (see the figure)

The cylindrical container is fitted with four equally spaced spiral baffles extending between 32 mm from the bottom and 57 mm from the lip, each baffle traversing half the internal circumference of the container. The baffles spiral downwards in a clockwise direction. There is a fillet of radius 13 mm around the inside of the base of the container.

The three-bladed propeller is mounted on a vertical shaft centrally in the container and a fixed distance above the bottom. It is driven at the specified speed in the stock and a counter is fitted to record the number of revolutions; the counter should preferably be of the pre-set type which will switch off the disintegrator after the required number of revolutions. Viewed from above, the propeller rotates in a clockwise direction.

The container is fixed firmly in position during operation of the disintegrator, but it is capable of being removed and replaced easily and quickly.

A.3 DIMENSIONS

Part		Dimension	Tolerance
Container	Internal height	191 mm	± 2 mm
	Internal diameter	152 mm	± 2 mm
	Radius of fillet	13 mm	To fit gauge
Baffles	Square section	6,5 mm	$\pm 1,0$ mm
	Height from container base	32 mm	± 1 mm
	Distance from rim	57 mm	± 1 mm
	Ends radiused	3 mm	To fit gauge
	Edges radiused	0,4 mm	To fit gauge
	Spacing (centres)	51 mm	± 1 mm
Propeller	Diameter	90,0 mm	$\pm 0,5$ mm
	Diameter of hub	22,0 mm	(minimum value)
	Separation-blades/container base	25 mm	± 2 mm
Propeller blades	Width at hub	17,5 mm	$\pm 0,5$ mm
	Maximum width	22,5 mm	$\pm 0,5$ mm
	Thickness	1,6 mm	$\pm 0,5$ mm
	Edges radiused	0,8 mm	To fit gauge
	Ends radiused	4 mm	To fit gauge
	Pitch	2°	$\pm 15'$
Propeller shaft	End taper	To fit any propeller hub	

A.4 ROTATIONAL FREQUENCY

The rotational frequency of the propeller shaft shall be $48,3 \pm 1,6 \text{ s}^{-1}$.

ANNEX B

CHECKING OF THE DISINTEGRATOR

(This annex forms part of the standard.)

The disintegrator shall be checked regularly, special care being taken to ensure that

- a) the propeller shaft rotates smoothly and is always centred with respect to the container;
- b) the propeller runs at the specified rotational frequency;
- c) the propeller blades are set as specified (this may be checked by means of a propeller gauge);
- d) the dimensions of the propeller blades are as specified.

If the apparatus is used properly, the other dimensions of the disintegrator should remain constant, they shall, however, be checked at intervals.

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