

Methods of test for

Cereals and pulses —

**Part 21: Determination of rheological
properties of doughs using an
extensograph**

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Food and Agriculture Standards Policy Committee (FAC/-) to Technical Committee FAC/4, upon which the following bodies were represented:

- AFRC Institute of Engineering Research
- Agricultural Engineers' Association
- Association of Public Analysts
- British Edible Pulse Association
- Department of Trade and Industry (Laboratory of the Government Chemist)
- Flour Milling and Baking Research Association
- Food and Drink Federation
- Grain and Feed Trade Association
- Home Grown Cereals Authority
- Institute of Brewing
- Institute of Food Science and Technology
- Intervention Board for Agricultural Produce
- Ministry of Agriculture, Fisheries and Food
- NABIM
- National Association of Commodity Cargo Superintendents and Surveyors
- National Farmers' Union
- Overseas Development Natural Resources Institute
- Society of Chemical Industry
- United Kingdom Agricultural Supply Trade Association Ltd.

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National foreword

This Part of BS 4317 has been prepared under the direction of the Food and Agriculture Standards Policy Committee. It is identical with ISO 5530-2:1988 “*Wheat flour — Physical characteristics of doughs — Part 2: Determination of rheological properties using an extensograph*” published by the International Organization for Standardization (ISO), and in the preparation of which the United Kingdom played a full part.

Cross-references

International Standard	Corresponding British Standard
ISO 712:1985	BS 4317 <i>Methods of test for cereals and pulses</i> Part 3:1987 <i>Determination of moisture content of cereals and cereal products (routine method)</i> (Identical)
ISO 2170:1980	BS 5333:1981 <i>Methods for sampling cereals and pulses (as milled products)</i> (Identical)
ISO 5530-1:1988	BS 4317 <i>Methods of test for cereals and pulses</i> Part 20:1989 <i>Determination of water absorption of flour and rheological properties of doughs using a farinograph</i> (Identical)

Additional information. With reference to 5.1, water complying with grade 3 of BS 3978 “*Specification for water for laboratory use*” is suitable.
A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.
This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This part of ISO 5530 specifies a method, using an extensograph¹⁾, for the determination of the stretching characteristics of a wheat flour dough.

The method is applicable to flour from wheat (*Triticum aestivum* Linnaeus).

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 5530. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 5530 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 712:1985, *Cereals and cereal products — Determination of moisture content (Routine reference method)*.

ISO 2170:1980, *Cereals and pulses — Sampling of milled products*.

ISO 5530-1:1988, *Wheat flour — Physical characteristics of doughs — Part 1: Determination of water absorption and rheological properties using a farinograph*.

3 Definition

For the purposes of this part of ISO 5530, the following definition applies.

stretching characteristics (of dough)

the resistance of dough to extension, expressed in arbitrary units (extensograph units, EU), and the extent to which it can be stretched until breaking, also expressed in arbitrary units (millimetres transposition of the band of paper in the recorder), under the operating conditions specified in this part of ISO 5530

4 Principle

Preparation of a dough from flour, water, and salt in a farinograph under specified conditions. Moulding of a test piece on the balling unit and moulder of the extensograph into a standard shape. After a fixed period of time, stretching the test piece, and recording the force required. Immediately after the first stretching, two repetitions, one after the other, with the same test piece, of moulding, rest period, and stretching.

The size and shape of the curves obtained are a guide to the baking characteristics of the flour.

5 Reagents

5.1 Distilled water, or water of equivalent purity.

5.2 Sodium chloride, of recognized analytical quality.

6 Apparatus

Usual laboratory equipment and, in particular, the following.

6.1 Extensograph, with a thermostat consisting of a constant temperature water-bath (See Annex A), with the following operating characteristics:

- Rotational frequency of balling unit: $(83 \pm 3) \text{ min}^{-1}$
- Rotational frequency of moulder: $(15 \pm 1) \text{ min}^{-1}$
- Hook speed: $(1,45 \pm 0,05) \text{ cm/s}$
- Chart speed: $(0,65 \pm 0,01) \text{ cm/s}$
- Force exerted per extensograph unit: $(12,3 \pm 0,3) \text{ mN/EU}$ [$(1,25 \pm 0,03) \text{ gf/EU}$]

NOTE Some instruments have a different calibration for force/unit deflection. The procedure described may be used with such instruments, but it is necessary for the different calibration to be taken into account when comparing the results with instruments calibrated as above.

6.2 Farinograph, connected to a similar thermostat as the extensograph, with the operating characteristics specified in ISO 5530-1, and a burette, as specified in ISO 5530-1.

6.3 Balance, accurate to 0,1 g.

6.4 Soft plastic spatula

6.5 Conical flask, of 250 ml capacity.

7 Sampling

Carry out sampling by the method specified in ISO 2170.

8 Procedure

8.1 Determination of the moisture content of the flour

Determine the moisture content of the flour using the method specified in ISO 712.

¹⁾ This part of ISO 5530 has been drawn up on the basis of the Brabender Extensograph.

This information is given for the convenience of users of this part of ISO 5530 and does not constitute an endorsement by ISO of this product.