

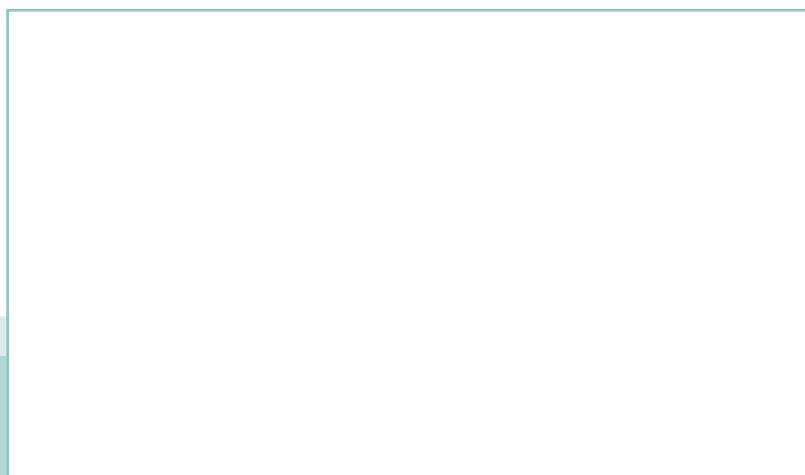
SVENSK STANDARD

SS-EN ISO 5530-2:2014



Fastställt/Approved: 2014-12-21
Publicerad/Published: 2015-01-15
Utgåva/Edition: 1
Språk/Language: engelska/English
ICS: 67.060

Wheat flour – Physical characteristics of doughs – Part 2: Determination of rheological properties using an extensograph (ISO 5530-2:2012)



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**Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 5530-2:2012/
Relations to other parts under the same general title - Extract from the Foreword of ISO 5530-2:2012**

ISO 5530 consists of the following parts, under the general title *Wheat flour — Physical characteristics of doughs*:

- Part 1: *Determination of water absorption and rheological properties using a farinograph*
- Part 2: *Determination of rheological properties using an extensograph*
- Part 3: *Determination of water absorption and rheological properties using a valorigraph*

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EUROPEAN STANDARD

EN ISO 5530-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2014

ICS 67.060

English Version

**Wheat flour - Physical characteristics of doughs - Part 2:
Determination of rheological properties using an extensograph
(ISO 5530-2:2012)**

Farines de blé tendre - Caractéristiques physiques des pâtes - Partie 2: Détermination des caractéristiques rhéologiques au moyen de l'extensographe (ISO 5530-2:2012)

Weizenmehl - Physikalische Eigenschaften von Teigen - Teil 2: Bestimmung der rheologischen Eigenschaften mittels Extensograph (ISO 5530-2:2012)

This European Standard was approved by CEN on 16 December 2014.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

The text of ISO 5530-2:2012 has been prepared by Technical Committee ISO/TC 34 "Food products" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 5530-2:2014 by Technical Committee CEN/TC 338 "Cereal and cereal products" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2015, and conflicting national standards shall be withdrawn at the latest by June 2015.

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Endorsement notice

The text of ISO 5530-2:2012 has been approved by CEN as EN ISO 5530-2:2014 without any modification.

Wheat flour — Physical characteristics of doughs —

Part 2: Determination of rheological properties using an extensograph

1 Scope

This part of ISO 5530 specifies a method, using an extensograph, for the determination of the rheological properties of wheat flour dough in an extension test. The recorded load–extension curve is used to assess general quality of flour and its response to improving agents.

The method is applicable to experimental and commercial flours from wheat (*Triticum aestivum* L.).

NOTE This part of ISO 5530 is based on ICC 114.^[3]

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 712, *Cereals and cereal products — Determination of moisture content — Reference method*

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

3 Terms and definitions

For the purposes of this part of ISO 5530, the following terms and definitions apply.

3.1

energy

capacity to do work

NOTE 1 For the purposes of this part of ISO 5530, the energy is determined as the area under a recorded curve. The energy describes the work applied when stretching a dough sample.

NOTE 2 The area is measured by a planimeter and reported in square centimetres.

3.2

extensibility

E

distance travelled by the recorder paper from the moment that the hook touches the test piece until rupture of (one of the strings of) the test piece

NOTE See 9.4 and Figure 1.

3.3

extensograph water absorption

volume of water required to produce a dough with a consistency of 500 farinograph units (FU) after 5 min mixing, under specified operating conditions

NOTE Extensograph water absorption is expressed in millilitres per 100 g of flour at 14,0 % mass fraction moisture content.

1) To be published. (Revision of ISO 5530-1:1997)

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3.4 maximum resistance
 R_m
mean of the maximum heights of the extensograph curves from the two test pieces, provided that the difference between them does not exceed 15 % of their mean value

NOTE See 9.3.1 and Figure 1.

3.5 ratio (*RIE*)
quotient of the maximum resistance, R_m , and the extensibility or the resistance after 50 mm transposition of the recorder paper, R_{50} , and the extensibility

NOTE The ratio is an additional factor in the review of the dough behaviour.

3.6 resistance at constant deformation
mean of the heights of the extensograph curves after 50 mm transposition of the recorder paper from the two test pieces, provided that the difference between them does not exceed 15 % of their mean value

NOTE See 9.3.2 and Figure 1.

3.7 stretching characteristics
<dough> resistance of dough to extension and the extent to which it can be stretched until breaking, under specified operating conditions

NOTE 1 The resistance is expressed in arbitrary units (extensograph units, EU).

NOTE 2 The extent of stretching is expressed in millimetres or centimetres.

4 Principle

Dough is prepared from flour, water and salt in a farinograph under specified conditions. A test piece is then moulded on the balling unit and moulder of the extensograph into a standard shape. After a fixed period of time, the test piece is stretched and the force required recorded. Immediately after these operations, the same test piece is subjected to two further cycles of moulding, rest period and stretching.

The size and shape of the curves obtained are a guide to the physical properties of the dough. These physical properties influence the end-use quality of the flour.

5 Reagents

Use only reagents of recognized analytical grade, unless otherwise specified, and distilled or demineralized water or water of equivalent purity.

5.1 Sodium chloride.

6 Apparatus

Usual laboratory apparatus and, in particular, the following.

6.1 Extensograph,²⁾ with a thermostat consisting of a constant temperature water bath (see Annex A), with the following operating characteristics:

2) This document has been drawn up on the basis of the Brabender Extensograph, which is an example of a suitable product available commercially. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of this product. Other equipment may be used if it can be shown to give comparable results.

- rotational frequency of balling unit: $(83 \pm 3) \text{ min}^{-1}$ (r/min);
- rotational frequency of moulder: $(15 \pm 1) \text{ min}^{-1}$ (r/min);
- 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: $(12,3 \pm 0,3) \text{ mN/EU}$ [$(1,25 \pm 0,03) \text{ gf/EU}$].

Some instruments have a different calibration for force/unit deflection. The procedure specified can 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.

NOTE An electronic extensograph can be used, see A.5.

6.2 Farinograph,³⁾ 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, capable of being read to the nearest $\pm 0,1 \text{ g}$.

6.4 Spatula, made of soft plastic.

6.5 Conical flask, of 250 ml capacity.

7 Sampling

Sampling is not part of the method specified in this International Standard. A recommended sampling method is given in ISO 24333.^[2]

It is important that the laboratory receive a truly representative sample which has not been damaged or changed during transport and storage.

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.

8.2 Preparation of apparatus

8.2.1 Turn on the thermostat of the farinograph (6.2) and circulate the water until the required temperatures are reached, prior to using the instrument. Before and during use, check the temperatures of

- the thermostats;
- the mixing bowl of the farinograph, in the hole provided for this purpose; and
- the extensograph cabinet.

All temperatures shall be $(30 \pm 0,2) \text{ }^\circ\text{C}$.

8.2.2 Adjust the arm of the pen of the extensograph so as to obtain zero reading when a cradle with both its clamps plus a 150 g mass ("weight") is placed in position.

3) The Farinograph is the trade name of a product supplied by Brabender. This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.