

# SVENSK STANDARD

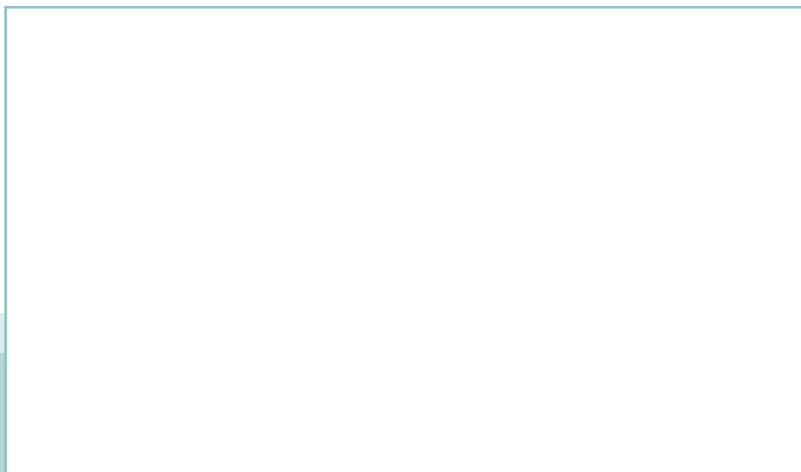
## SS-EN ISO 5530-1:2014



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 1: Determination of water absorption and rheological properties using a farinograph (ISO 5530-1:2013)**



# Standarder får världen att fungera

*SIS (Swedish Standards Institute) är en fristående ideell förening med medlemmar från både privat och offentlig sektor. Vi är en del av det europeiska och globala nätverk som utarbetar internationella standarder. Standarder är dokumenterad kunskap utvecklad av framstående aktörer inom industri, näringsliv och samhälle och befrämjar handel över gränser, bidrar till att processer och produkter blir säkrare samt effektiviserar din verksamhet.*

## Delta och påverka

Som medlem i SIS har du möjlighet att påverka framtida standarder inom ditt område på nationell, europeisk och global nivå. Du får samtidigt tillgång till tidig information om utvecklingen inom din bransch.

## Ta del av det färdiga arbetet

Vi erbjuder våra kunder allt som rör standarder och deras tillämpning. Hos oss kan du köpa alla publikationer du behöver – allt från enskilda standarder, tekniska rapporter och standardpaket till handböcker och onlinetjänster. Genom vår webbtjänst e-nav får du tillgång till ett lättnavigerat bibliotek där alla standarder som är aktuella för ditt företag finns tillgängliga. Standarder och handböcker är källor till kunskap. Vi säljer dem.

## Utveckla din kompetens och lyckas bättre i ditt arbete

Hos SIS kan du gå öppna eller företagsinterna utbildningar kring innehåll och tillämpning av standarder. Genom vår närhet till den internationella utvecklingen och ISO får du rätt kunskap i rätt tid, direkt från källan. Med vår kunskap om standarders möjligheter hjälper vi våra kunder att skapa verklig nytta och lönsamhet i sina verksamheter.

**Vill du veta mer om SIS eller hur standarder kan effektivisera din verksamhet är du välkommen in på [www.sis.se](http://www.sis.se) eller ta kontakt med oss på tel 08-555 523 00.**



# Standards make the world go round

*SIS (Swedish Standards Institute) is an independent non-profit organisation with members from both the private and public sectors. We are part of the European and global network that draws up international standards. Standards consist of documented knowledge developed by prominent actors within the industry, business world and society. They promote cross-border trade, they help to make processes and products safer and they streamline your organisation.*

## Take part and have influence

As a member of SIS you will have the possibility to participate in standardization activities on national, European and global level. The membership in SIS will give you the opportunity to influence future standards and gain access to early stage information about developments within your field.

## Get to know the finished work

We offer our customers everything in connection with standards and their application. You can purchase all the publications you need from us - everything from individual standards, technical reports and standard packages through to manuals and online services. Our web service e-nav gives you access to an easy-to-navigate library where all standards that are relevant to your company are available. Standards and manuals are sources of knowledge. We sell them.

## Increase understanding and improve perception

With SIS you can undergo either shared or in-house training in the content and application of standards. Thanks to our proximity to international development and ISO you receive the right knowledge at the right time, direct from the source. With our knowledge about the potential of standards, we assist our customers in creating tangible benefit and profitability in their organisations.

**If you want to know more about SIS, or how standards can streamline your organisation, please visit [www.sis.se](http://www.sis.se) or contact us on phone +46 (0)8-555 523 00**



Europastandarden EN ISO 5530-1:2014 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 5530-1:2014.

The European Standard EN ISO 5530-1:2014 has the status of a Swedish Standard. This document contains the official version of EN ISO 5530-1:2014.

**Förhållandet till övriga delar under samma huvudtitel - Utdrag ur Förord i ISO 5530-1:2013/  
Relations to other parts under the same general title - Extract from the Foreword of ISO 5530-1:2013**

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*

© Copyright/Upphovsrätten till denna produkt tillhör SIS, Swedish Standards Institute, Stockholm, Sverige. Användningen av denna produkt regleras av slutanvändarlicensen som återfinns i denna produkt, se standardens sista sidor.

© Copyright SIS, Swedish Standards Institute, Stockholm, Sweden. All rights reserved. The use of this product is governed by the end-user licence for this product. You will find the licence in the end of this document.

*Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.*

*Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.*

Denna standard är framtagen av kommittén för Livsmedel och foder, SIS/TK 435.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på [www.sis.se](http://www.sis.se) - där hittar du mer information.



EUROPEAN STANDARD

**EN ISO 5530-1**

NORME EUROPÉENNE

EUROPÄISCHE NORM

December 2014

---

ICS 67.060

English Version

**Wheat flour - Physical characteristics of doughs - Part 1:  
Determination of water absorption and rheological properties  
using a farinograph (ISO 5530-1:2013)**

Farines de blé tendre - Caractéristiques physiques des pâtes - Partie 1: Détermination de l'absorption d'eau et des caractéristiques rhéologiques au moyen du farinographe (ISO 5530-1:2013)

Weizenmehl - Physikalische Eigenschaften von Teigen - Teil 1: Bestimmung der Wasserabsorption und der rheologischen Eigenschaften mittels Farinograph (ISO 5530-1:2013)

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

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

<b>Contents</b>		Page
<b>Foreword</b> .....		<b>iv</b>
<b>1 Scope</b> .....		<b>1</b>
<b>2 Normative references</b> .....		<b>1</b>
<b>3 Terms and definitions</b> .....		<b>1</b>
<b>4 Principle</b> .....		<b>3</b>
<b>5 Reagent</b> .....		<b>3</b>
<b>6 Apparatus</b> .....		<b>3</b>
<b>7 Sampling</b> .....		<b>3</b>
<b>8 Procedure</b> .....		<b>4</b>
8.1 Determination of the moisture content of the flour .....		4
8.2 Preparation of farinograph .....		4
8.3 Test portion .....		4
8.4 Common rules of determination .....		8
<b>9 Evaluation of the farinogram and calculation of the derived rheological characteristics</b> .....		<b>8</b>
9.1 General .....		8
9.2 Water absorption of flour .....		8
9.3 Characteristics relating to the consistency of dough .....		9
<b>10 Precision</b> .....		<b>10</b>
10.1 Interlaboratory tests .....		10
10.2 Repeatability .....		11
10.3 Reproducibility .....		11
<b>11 Test report</b> .....		<b>11</b>
<b>Annex A (informative) Description of the farinograph</b> .....		<b>12</b>
<b>Annex B (informative) Examples of farinograms</b> .....		<b>17</b>
<b>Annex C (informative) Results of interlaboratory tests</b> .....		<b>22</b>
<b>Bibliography</b> .....		<b>26</b>

## Foreword

The text of ISO 5530-1:2013 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 5530-1:2014 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.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of ISO 5530-1:2013 has been approved by CEN as EN ISO 5530-1:2014 without any modification.





# Wheat flour — Physical characteristics of doughs —

## Part 1:

# Determination of water absorption and rheological properties using a farinograph

## 1 Scope

This part of ISO 5530 specifies a method, using a farinograph, for the determination of the water absorption of flours and the mixing behaviour of doughs made from them by a constant flour mass procedure, or by a constant dough mass procedure.

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

NOTE This part of ISO 5530 is based on ICC 115/1[1] and AACC Method 54-21.2.[2]

## 2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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*

## 3 Terms and definitions

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

### 3.1

#### **consistency**

resistance of a dough to being mixed in a farinograph at a specified constant speed

Note 1 to entry: It is expressed in farinograph arbitrary units (see 3.2).

### 3.2

#### **farinograph unit**

#### **FU**

arbitrary unit for consistency on the farinogram

Note 1 to entry: For the mathematical expression of farinograph units, see 6.1.

Note 2 to entry: It is also possible to define “farinograph unit (FU)” as a twisting moment of 100 g. cm, measured in the axis of the mixer.

### 3.3

#### **maximum consistency**

consistency measured at the end of dough development time

Note 1 to entry: For the mathematical expression of maximum consistency, see 9.2.

Note 2 to entry: It is expressed in farinograph units (FU).

Note 3 to entry: See 3.7.

**SS-EN ISO 5530-1:2014 (E)****3.4****water absorption of flour**

volume of water required to produce a dough with a maximum consistency of 500 FU, under the specified operating conditions

Note 1 to entry: Water absorption is expressed in millilitres per 100 g of flour at 14 % (mass fraction) moisture content to an accuracy of 0,1 ml.

**3.5****dough development time****DDT**

peak time

time from the beginning of the addition of water to the point on the curve immediately before the first sign of the decrease of maximum consistency

Note 1 to entry: In those cases where two maxima are observed, use the second maximum to measure the dough development time.

Note 2 to entry: See [Figure 1](#) and 9.3.

Note 3 to entry: It is expressed in minutes to the nearest 0,1 min.

**3.6****stability**

difference in time between the point where the top part of the curve intercepts, for the first time, the line of 500 FU and the last point where leaves this line

Note 1 to entry: This value, in general, gives some indication of the tolerance of the flour to mixing.

Note 2 to entry: When the maximum consistency deviates from the  $(500 \pm 20)$  FU line, the line of this consistency should be used to read the interceptions.

Note 3 to entry: The stability is expressed in minutes, to an accuracy of 0,5 min.

**3.7****degree of softening**

difference between the centre of the curve at the point where it begins to decline and the centre of the curve 12 min after that point

Note 1 to entry: It is expressed in farinograph units (FU).

Note 2 to entry: In the case where two peaks appear, the second peak is considered.

Note 3 to entry: The degree of softening should be expressed to the nearest 5 FU.

Note 4 to entry: If another time is used to carry out this method, this has to be detailed in the report along with information on the reference standard applied. The definite time is usually 12 min.

**3.8****mixing tolerance index****MTI**

difference from the top of the curve at peak (DDT) to the top of the curve measured at 5 min after peak is reached

Note 1 to entry: It is expressed in farinograph units (FU).

**3.9****farinograph quality number****FQN**

length, along the time axis, between the point of the addition of water and the point where the height of the centre of the curve has decreased by 30 FU, compared to the height of the centre of the curve at DDT

Note 1 to entry: It is expressed in millimetres to an accuracy of 1 mm.

## 4 Principle

Measuring and recording, by means of a farinograph, the consistency of a dough as it is formed from flour and water, as it is developed, and as it changes with time.

NOTE The maximum consistency of the dough is adjusted to a fixed value by adapting the quantity of water added. The correct water addition, which is called the water absorption, is used to obtain a complete mixing curve, the various features of which are a guide to the rheological properties (strength) of the dough.

## 5 Reagent

Use only distilled or demineralized water or water of equivalent purity.

## 6 Apparatus

The usual laboratory apparatus and, in particular, the following:

**6.1 Farinograph**<sup>1)</sup> (see [Annex A](#)), with the following operating characteristics:

- slow blade rotational frequency:  $(63 \pm 2) \text{ min}^{-1}$  (rev/min); the ratio of the rotational frequencies of the mixing blades shall be  $1,50 \pm 0,01$ ;
- torque per farinograph unit:
  - for a 300 g mixer:  $(9,8 \pm 0,2) \text{ mN}\cdot\text{m}/\text{FU}$  [ $(100 \pm 2) \text{ gf}\cdot\text{cm}/\text{FU}$ ];
  - for a 50 g mixer:  $(1,96 \pm 0,04) \text{ mN}\cdot\text{m}/\text{FU}$  [ $(20 \pm 0,4) \text{ gf}\cdot\text{cm}/\text{FU}$ ];
  - chart speed:  $(1,00 \pm 0,03) \text{ cm}/\text{min}$ .

### 6.1.1 Burettes.

- a) for a 300 g mixer, graduated from 135 ml to 225 ml in 0,2 ml divisions.
- b) for a 50 g mixer, graduated from 22,5 ml to 37,5 ml in 0,1 ml divisions.

**6.1.2 Thermostat**, with circulating water for constant temperature  $(30 \pm 0,2) \text{ }^\circ\text{C}$ .

**6.2 Balance**, capable of weighing to the nearest  $\pm 0,1 \text{ g}$ .

**6.3 Spatula**, thin, made of soft plastic.

## 7 Sampling

Sampling is not part of the method specified in this part of ISO 5530. A recommended sampling method is given in ISO 24333.<sup>[3]</sup>

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

---

1) This part of ISO 5530 has been drawn up on the basis of the Brabender Farinograph, which is an example of a suitable product available commercially. 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. Other equipment may be used if it can be shown to give comparable results.