



NSAI
Standards

Irish Standard
I.S. EN ISO 27971:2015

Cereals and cereal products - Common wheat (*Triticum aestivum* L.) - Determination of alveograph properties of dough at constant hydration from commercial or test flours and test milling methodology (ISO 27971:2015)

I.S. EN ISO 27971:2015

Incorporating amendments/corrigenda/National Annexes issued since publication:

The National Standards Authority of Ireland (NSAI) produces the following categories of formal documents:

I.S. xxx: Irish Standard — national specification based on the consensus of an expert panel and subject to public consultation.

S.R. xxx: Standard Recommendation — recommendation based on the consensus of an expert panel and subject to public consultation.

SWiFT xxx: A rapidly developed recommendatory document based on the consensus of the participants of an NSAI workshop.

This document replaces/revises/consolidates the NSAI adoption of the document(s) indicated on the CEN/CENELEC cover/Foreword and the following National document(s):

NOTE: The date of any NSAI previous adoption may not match the date of its original CEN/CENELEC document.

This document is based on:

EN ISO 27971:2015

Published:

2015-06-10

*This document was published
under the authority of the NSAI
and comes into effect on:*

2015-07-02

ICS number:

67.060

NOTE: If blank see CEN/CENELEC cover page

NSAI
1 Swift Square,
Northwood, Santry
Dublin 9

T +353 1 807 3800
F +353 1 807 3838
E standards@nsai.ie
W NSAI.ie

Sales:
T +353 1 857 6730
F +353 1 857 6729
W standards.ie

Údarás um Chaighdeáin Náisiúnta na hÉireann

EUROPEAN STANDARD

EN ISO 27971

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2015

ICS 67.060

Supersedes EN ISO 27971:2008

English Version

Cereals and cereal products - Common wheat (*Triticum aestivum* L.) - Determination of alveograph properties of dough at constant hydration from commercial or test flours and test milling methodology (ISO 27971:2015)

Céréales et produits céréaliers - Blé tendre (*Triticum aestivum* L.) - Détermination des propriétés alvéographiques d'une pâte à hydratation constante de farine industrielle ou d'essai et méthodologie pour la mouture d'essai (ISO 27971:2015)

Getreide und Getreideerzeugnisse - Weizen (*Triticum aestivum* L.) - Bestimmung der Eigenschaften von Teig bei konstanter Flüssigkeitszufuhr zu handelsüblichen Mehlen oder Versuchsmehlen bei gleichen Versuchsmahlverfahren mittels Alveograph (ISO 27971:2015)

This European Standard was approved by CEN on 16 April 2015.

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

Contents

Page

Foreword.....	3
----------------------	----------

Foreword

This document (EN ISO 27971:2015) has been prepared by Technical Committee ISO/TC 34 "Food products" in collaboration with 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 December 2015, and conflicting national standards shall be withdrawn at the latest by December 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.

This document supersedes EN ISO 27971:2008.

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 27971:2015 has been approved by CEN as EN ISO 27971:2015 without any modification.

This page is intentionally left blank

INTERNATIONAL STANDARD

ISO
27971

Second edition
2015-06-01

Cereals and cereal products — Common wheat (*Triticum aestivum* L.) — Determination of alveograph properties of dough at constant hydration from commercial or test flours and test milling methodology

Céréales et produits céréaliers — Blé tendre (Triticum aestivum L.) — Détermination des propriétés alvéographiques d'une pâte à hydratation constante de farine industrielle ou d'essai et méthodologie pour la mouture d'essai



Reference number
ISO 27971:2015(E)

© ISO 2015

ISO 27971:2015(E)



COPYRIGHT PROTECTED DOCUMENT

© ISO 2015, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Principle	1
4 Reagents	1
5 Apparatus	2
6 Sampling	9
7 Preparation of the wheat for laboratory milling	10
7.1 Cleaning the laboratory sample	10
7.2 Test portion	10
7.3 Wheat moisture content determination	10
7.4 Wheat preparation	10
7.4.1 General	10
7.4.2 Wheat with initial moisture content between 13 % and 15 % (one-stage moistening)	10
7.4.3 Wheat with a moisture content less than 13 % (two-stage moistening)	10
7.4.4 Wheat with a moisture content greater than 15 % (preliminary drying followed by moistening, as described above)	11
8 Laboratory milling	11
8.1 General	11
8.2 Milling procedure	11
8.2.1 Breaking	11
8.2.2 Reduction	11
8.2.3 Flour homogenization	12
8.2.4 Storage of the flour	12
8.3 Expression of milling results	12
9 Preparation and alveograph test	13
9.1 Preliminary checks	13
9.2 Preliminary operations	14
9.3 Kneading	15
9.4 Preparation of dough test pieces	16
9.5 Alveograph test	20
9.5.1 Initial preparation	20
9.5.2 First operation: Adjusting the dough test piece	21
9.5.3 Second operation: biaxial extension	22
9.6 Expression of alveograph test results	23
9.6.1 General	23
9.6.2 Maximum pressure parameter, P	23
9.6.3 Mean abscissa at rupture, L	23
9.6.4 Swelling index, G	24
9.6.5 Elasticity index	24
9.6.6 Curve configuration ratio, P/L	24
9.6.7 Deformation work, W	24
10 Precision	24
10.1 Interlaboratory tests	24
10.2 Repeatability limits	25
10.2.1 Commercial flour: limits established by the interlaboratory test	25
10.2.2 Flour obtained from laboratory milling	25
10.3 Reproducibility limits	25

ISO 27971:2015(E)

10.3.1	Commercial flour: Limits established by the proficiency tests.....	25
10.3.2	Flour obtained from laboratory milling.....	26
10.4	Uncertainty.....	26
11	Test report.....	26
Annex A (informative)	Characteristics of the Chopin-Dubois CD1 mill.....	27
Annex B (normative)	Quantity of water to be added to wheat for conditioning.....	29
Annex C (informative)	Sample milling sheet.....	31
Annex D (informative)	Conversion table from <i>L</i> to <i>G</i>.....	32
Annex E (informative)	Interlaboratory and proficiency test data for commercial flours.....	34
Annex F (informative)	Interlaboratory data for laboratory milled flour.....	44
Annex G (informative)	Routine maintenance instructions for the alveograph.....	61
Annex H (informative)	Assessment of proteolytic activity in wheat (<i>T. aestivum</i> L.) or flour.....	63
Bibliography		65

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 34, *Food products*, Subcommittee SC 4, *Cereals and pulse*.

This second edition cancels and replaces the first edition (ISO 27971:2008), which has been technically revised.

ISO 27971:2015(E)

Introduction

The end-use value of wheat is determined by a number of properties that are useful in the manufacture of baked products such as bread, rusks, and biscuits.

Such properties include the important viscoelastic (rheological) properties of dough formed as a result of flour hydration and kneading. An alveograph is used to study the main parameters by subjecting a dough test piece to biaxial extension (producing a dough bubble) by inflating it with air, which is similar to the deformation to which it is subjected during panary fermentation.

Recording the pressure generated inside the bubble throughout the deformation of the dough test piece until it ruptures provides information on the following:

- a) the resistance of the dough to deformation, or its strength. It is expressed by the maximum pressure parameter, P ;
- b) the extensibility or the possibility of inflating the dough to form a bubble; It is expressed by the parameters of extensibility, L , or swelling, G ;
- c) the elasticity of the dough during biaxial extension. It is expressed by the elasticity index, I_e ;
- d) the work required to deform the dough bubble until it ruptures, which is proportional to the area of the alveogram (sum of the pressures throughout the deformation process). It is expressed by the parameter, W .

The P/L ratio is a measurement of the balance between strength and extensibility.

Alveographs are commonly used throughout the wheat and flour industry, for the following purposes:

- selecting and assessing different varieties of wheat and marketing batches of wheat;
- blending different batches of wheat or flour to produce a batch with given values for the alveographic criteria (W , P , and L) complying with the proportional laws of blending.

Alveographs are used both on the upstream side of the industry for marketing, selecting and assessing the different wheat varieties and on the downstream side throughout the baking industries (see Bibliography).

Cereals and cereal products — Common wheat (*Triticum aestivum* L.) — Determination of alveograph properties of dough at constant hydration from commercial or test flours and test milling methodology

1 Scope

This International Standard specifies a method of determining, using an alveograph, the rheological properties of different types of dough obtained from common wheat flour (*Triticum aestivum* L.) produced by industrial milling or laboratory milling.

It describes the alveograph test and how to use a laboratory mill to produce flour in two stages:

- stage 1: preparation of the wheat grain for milling to make it easier to separate the bran from the endosperm (see [Clause 7](#));
- stage 2: the milling process, including breaking between three fluted rollers, reduction of particle size between two smooth rollers and the use of a centrifugal sieving machine to grade the products (see [Clause 8](#)).

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 660, *Animal and vegetable fats and oils — Determination of acid value and acidity*

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

ISO 12099, *Animal feeding stuffs, cereals and milled cereal products — Guidelines for the application of near infrared spectrometry*

3 Principle

The behaviour of dough obtained from a mixture of different types of flour and salt water is evaluated during deformation. A dough disk is subjected to a constant air flow; at first it withstands the pressure. Subsequently, it inflates into a bubble, according to its extensibility, and ruptures. The change in the dough is measured and recorded in the form of a curve called an alveogram.

4 Reagents

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

4.1 Sodium chloride solution, obtained by dissolving $(25 \pm 0,2)$ g of sodium chloride (NaCl) in water and then making the volume up to 1 000 ml. This solution shall not be stored for more than 15 d and its temperature shall be (20 ± 2) °C when used.

This is a free preview. Purchase the entire publication at the link below:

[Product Page](#)

-
- Looking for additional Standards? Visit Intertek Inform Infostore
 - Learn about LexConnect, All Jurisdictions, Standards referenced in Australian legislation
-