

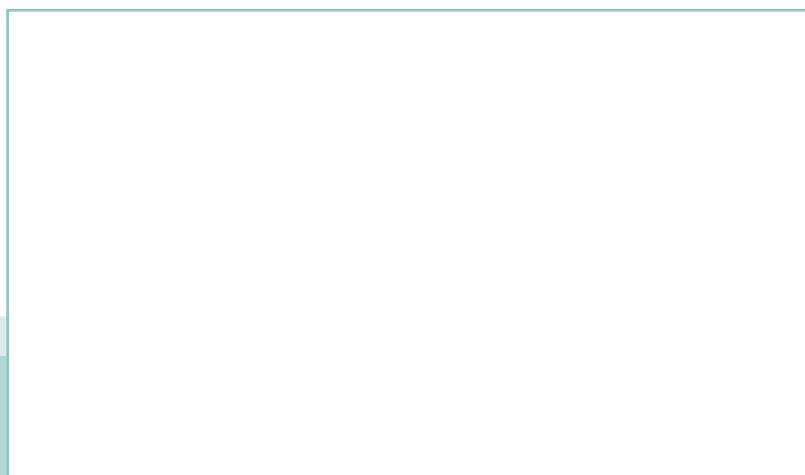
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Cereals and cereal products – Common wheat (*Triticum aestivum* L.) – Determination of alveograph properties of dough at constant hydration from commercial or test flours and test milling methodology (ISO 27971:2015)



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The European Standard EN ISO 27971:2015 has the status of a Swedish Standard. This document contains the official English version of EN ISO 27971:2015.

This standard supersedes the Swedish Standard SS-EN ISO 27971:2008, edition 1.

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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.

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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of an identical text or by endorsement, at the latest by December 2015, and conflicting national standards shall be withdrawn at the latest by December 2015.

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

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.