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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**

*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*



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## 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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 27971 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 338, *Cereal and cereal products*, in collaboration with Technical Committee ISO/TC 34, *Food products*, Subcommittee SC 4, *Cereals and pulses*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This first edition of ISO 27971 cancels and replaces ISO 5530-4:2002, which has been technically revised to specify the preparation of a test flour, to present complete precision data, and to add one annex giving aleveograph maintenance advice and another for the assessment of proteolytic activity in wheat or flour.

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## 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 rupture provides information on:

- the resistance of the dough to deformation, or its strength (stiffness). It is expressed by the maximum pressure parameter,  $P$ ;
- the extensibility or the possibility of inflating the dough to form a bubble. It is expressed by the parameters of extensibility,  $L$ , or swelling,  $G$ ;
- the elasticity of the dough during biaxial extension. It is expressed by the elasticity index,  $I_e$ ;
- the energy required to deform the dough bubble until it bursts, 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 tenacity 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 varieties and on the downstream side throughout the baking industries (see Bibliography).