
International Standard



6820

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Wheat flour and rye flour — General guidance on the drafting of bread-making tests

Farines de blé tendre et de seigle — Directives générales pour la rédaction des essais de panification

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

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Wheat flour and rye flour — General guidance on the drafting of bread-making tests

0 Introduction

The international standardization of the drafting of a method for a bread-making test does not exclude the maintaining of national or local methods corresponding to the needs and habits of a region. This International Standard is intended for reference and may be particularly useful in the drafting of a method for interlaboratory tests.

In order to facilitate exchanges, it is important that each of these methods be fully understood and reproducible in all other countries, irrespective of how different they may be. It is also desirable to harmonize requirements concerning materials, the quantities of ingredients, and other conditions, for all methods serving for the production of the same types of bread.

When national methods have been written in this form, it will be possible to compare them and to consider whether any rationalization for each type of bread is possible.

1 Scope and field of application

This International Standard gives general guidance on the drafting of bread-making tests for wheat flour and rye flour, irrespective of whether the flours are commercial or experimental.

It follows the standard layout widely used for methods of analysis and thus ensures that no element is left unconsidered by the user when elaborating or drafting a bread-making test.

2 References

ISO 712, *Cereals and cereal products — Determination of moisture content (Routine method)*.

ISO 2170, *Cereals and pulses — Sampling of milled products*.

ISO 3093, *Cereals — Determination of falling number*.

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

ISO 5530/3, *Wheat flour — Physical characteristics of doughs — Part 3: Determination of water absorption and rheological properties using a valorigraph*.¹⁾

1) At present at the stage of draft.

3 Drafting

The description of the bread-making test shall contain all the clauses enumerated below.

Text printed in italics is specific for the particular conditions of certain methods.

3.1 Scope and field of application

This clause shall identify the test and shall specify:

- a) the original cereal: wheat, rye or a mixture of species, *indicating, if necessary, the relative proportions;*

NOTE — The original cereal may be triticale.

- b) the type of flour:
 - 1) industrially prepared flour for bread-making,
 - 2) experimental flour of a cereal considered to be suitable for bread-making,
 - 3) experimental flour of a pure variety of cereal.

3.2 References

This clause shall contain a complete list of all the documents which the user of the standard will need to consult. In particular, reference should be made to the International Standards listed in clause 2 if these are essential.

3.3 Principle

This clause shall indicate (preferably by substantive phrases) the essential phases of the method, mentioning, in particular

- a) the presence of ingredients other than flour, water, yeast and salt;
- b) the conditions and manner of mixing (rapid, intensified, slow, etc.);
- c) the conditions and the duration of fermentation;
- d) the type of moulding.

3.4 Ingredients

This clause shall describe the characteristics, the method of preparation and the method of storage of the various ingredients other than the flour to be used for the bread-making test.

3.4.1 Water.

This clause shall indicate the nature of the water to be used, for example drinking water, together with the temperature at which it is to be used or, if necessary, to which it has to be heated.

3.4.2 Yeast.

This clause shall specify the conditions of use and storage of the yeast. If dry yeast is to be used, the conditions for its reactivation shall also be specified.

3.4.3 Salt.

3.4.4 Malt.

This clause shall specify the falling number, determined in accordance with ISO 3093, above which malt is to be added.

The nature and the origin of the malt used shall be indicated.

3.4.5 *Other ingredients such as sugar, ascorbic acid, fat, potassium bromate, ammonium phosphate, etc.*

3.5 Apparatus

3.5.1 *Apparatus for determining the water absorption of the dough: for example a farinograph (see ISO 5530/1) or valorigraph (see ISO 5530/3).*

3.5.2 Dough mixer.

- Type. If necessary, the number and the characteristics of the arms (kneaders).
- Capacity of the bowl, in litres.
- Speeds (rotational frequencies), in rotations per minute or min^{-1} .

3.5.3 Fermentation chamber.

- Temperature, in degrees Celsius, and tolerance.
- Relative humidity, as a percentage, and tolerance.
- Induced air-flow: none, moderate rate or high rate.

3.5.4 Fermentation vessel.

- Nature, form and capacity of the vessel.

3.5.5 Baking sheets or baking pans.

- Material: type and thickness, in millimetres.
- Dimensions, in millimetres.

3.5.6 Moulder.

- Type.
- *Main characteristics, especially the nature of the work performed: rolling, lamination, extension, folding, etc.*

3.5.7 Oven.

- Type.
- Whether with or without admission of water vapour.
- Temperature, in degrees Celsius, and tolerance.
- Other special characteristics, especially the ratio to be observed between the quantity to be cooked and the capacity of the oven.

3.5.8 Apparatus for measuring the volume of the bread.

- Type, or a summarized description.

3.5.9 Other apparatus.

- Balances, etc.

3.5.10 *Apparatus for measuring the energy used during dough mixing.*

3.6 Sampling

Proceed in accordance with ISO 2170.

3.7 Procedure

3.7.1 Preliminary operations

3.7.1.1 Determination of the mass of flour required for the test

Determine the moisture content of the flour by the method specified in ISO 712.

Calculate the mass, in grams, of flour required for the test, corresponding to X g with a moisture content of 14 % (m/m) preferably taking one of the following values as the value of X

100; 350; 1 000; 1 500; 2 000.

3.7.1.2 Determination of quantity of water required for the test

The quantity of water required for the test should preferably be evaluated using an apparatus for determining the water absorption of the dough (3.5.1).

When determined using the farinograph, the quantity of water is that required to obtain a consistency of 500 FU in accordance with ISO 5530/1, if required corrected (decreased or increased) by a defined percentage.

3.7.1.3 Determination of the quantity of malt required for the test

Give the information necessary for the calculation.

3.7.1.4 Conditions in the bakery

Measure and record the ambient conditions in the bakery: temperature, humidity and *barometric pressure*.

3.7.2 Mixing

Describe the different operations in chronological order

- Preparation of the dough mixer (temperature, etc.).
- Weighing and introducing the flour (3.7.1.1).
- Nature and quantity of ingredients to be added before starting the dough mixer.
- Operating conditions of the dough mixer: speed, duration. *Measurement of the energy used during dough mixing.*
- *Addition of other ingredients: nature and quantities.*
- *Measurement of the temperature of the dough.*
- *Evaluation of the dough.*
- *Operation of the dough mixer at a second speed: duration.*
- *Measurement of the temperature of the dough.*
- *Evaluation of the dough.*
- *Shaping of the dough.*

3.7.3 Bulk fermentation or first proof (first fermentation)

- Placing the dough into the fermentation vessel (3.5.4), or, if necessary, division of the dough and shaping of individual pieces.
- Introduction into the fermentation chamber (3.5.3) and the total duration of fermentation.
- *If, during fermentation, the dough is reworked, indicate the nature and the conditions of this "reworking" ("punch"), the number of reworkings and the time interval between them.*
- *Evaluation of the dough during and at the end of bulk fermentation.*

3.7.4 Shaping

- Indicate the mode of operation and the operations performed by the moulder (3.5.6).
- In the case of manual work (which is exceptional), describe the different stages of shaping.
- *Evaluation of the dough and/or the individual dough pieces during and at the end of shaping.*

3.7.5 Proof (second fermentation)

- Placing the dough on a baking sheet or in the baking pan (3.5.5).
- Introduction into the fermentation chamber (3.5.3) and the total duration of fermentation.
- *Evaluation of the dough and/or the individual dough pieces during and at the end of proofing.*

3.7.6 Baking

- *Preparation before putting the dough into the oven, for example notching.*
- Putting into the oven: temperature and duration.
- *Admission of water vapour.*

3.7.7 Determination of the mass and volume of the bread and evaluation

Specify the time and conditions of cooling after baking before determining the mass and volume and evaluating the bread.

Indicate the procedure used to determine the mass and volume of the bread *and, if necessary, other criteria such as the dimensions of the bread.*

Evaluate the bread, giving, for each characteristic, either an adjective chosen from a list or freely chosen, or a number determined according to a previously established scale. The characteristics may relate to the general appearance (shape, flavour, etc.), the appearance of the crust (colour, texture, etc.) and the aspect of the interior (colour, texture, etc.).

3.8 Expression of results

This clause shall refer to all the measurements and evaluations required as indicated in the procedure, together with all useful complementary calculations, for example water absorption of the flour, mass of the bread compared to that of the flour, etc.

Attach, if possible, a model report form for the results.

Overall evaluation of the suitability or unsuitability of the flour for bread-making, or classification into previously defined categories.

3.9 Test report

This clause shall show the method used and the results obtained together with the conditions, in particular the temperature and humidity, in the bakery. It shall also mention any operating conditions not specified in the bread-making

test, or regarded as optional, as well as any circumstances that may have influenced the result.

It shall include all the details required for the complete identification of the sample.

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