Benefits of the Falling Number Test

Falling Number measurement has a direct impact on your operating profits. It is a method with many uses in many industries:

- Detect sprouted wheat, barley and rye
- Measure the alpha-amylase activity of flour
- Avoid mixing sound and sprouted grain
- Blend grains to optimize the Falling Number value
- Charge premiums and maximize the value of quality grain

Silos, Grain Handling and Trading

The Falling Number test is used to segregate sprouted grain from sound products - imperative when as little as 5 % of sprouted grain, mixed with 95 % sound grain, renders the entire mixture unacceptable. In addition, the Falling Number test results are used to classify grain for different end-user requirements, helping traders to purchase the most suitable grain.

Grain profits can be further maximized by mixing high grade and lower grade grain to achieve the desired product characteristics and providing the user with consistent, good quality raw material suitable for each specific purpose.

Flour Milling

Flour Millers test all incoming grain to ensure suitability for the specific flour product in question. Segregating poor quality grain prior to milling saves time, effort and money. It is also important to avoid poor quality grain being mixed with good quality, as this may destroy the entire mixture.

Further, the addition of Fungal Enzymes can be optimized. By using the correct amount of enzyme, savings and quality improvements are realized.

Baking

By testing incoming flour, incorrect deliveries as well as many process problems and resulting product rejects are avoided. With in-house testing, bakers can easily and quickly identify or rule out Falling Number as a cause for difficulties.

Pasta Manufacturing

Raw material suitability is quickly evaluated by testing the incoming grains and flours. Many process problems and resulting rejects are avoided, resulting in savings, decreased down time, and increased operating margins.

Malting

By measuring the Falling Number at the intake, loads with barley of low ability to germinate during the malting process can be rejected while loads with higher Falling Number can be accepted with confidence.

Required Equipment

Falling Number Apparatus

The easy-to-use instruments are available as single and dual models. Options include printer, bar code reader for sample ID input and serial output for connection to laboratory information systems. All Falling Number units include viscometer tubes and stirrer.

Balance

Required accuracy: ± 0,05 g or better.

Laboratory Mill 120 or 3100

Large capacity hammer type cyclone mill with 0,8 mm sieve is used for preparing samples of whole grain. A large sample size (300 g) is required to avoid sampling errors.

Accessories

Shakematic 1095

Specifically designed and built for mixing samples for Falling Number analysis, providing operators with a convenient tool to ensure consistent sample mixing.

Cooling Tower

Re-circulation of the cooling-water avoids water waste, saves costs and is environment-friendly.

Dispenser

The Dispenser easily and accurately adds the 25 ml of water required for each test.

Spolett 1010

Rapid cleaner for viscometer tubes. The Spolett tube cleaner fits on an ordinary water tap and facilitates the cleaning of viscometer tubes.

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Perten INSTRUMENTS

Falling Number

Application & Method

Falling Number:
The only worldwide recognized method for sprout damage detection in flour and meal of wheat, rye, barley, other grains and malted cereals.

Perten INSTRUMENTS

The World Standard Method

The Falling Number Method is the worldwide industry standard and accepted method for detecting sprout damage in flour and meal of wheat, durum, rye, barley, other grains and malted cereals. Approved methods include: AACC/No. 56-81 B, ICC/No. 107/1, ISO/DIS 3093 and ASBC. The Falling Number is the established trading parameter for detection of sprouted grain.

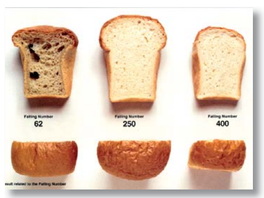
Field-Sprouting

Rainy, adverse weather conditions during harvest can cause sprouting. When sprouting occurs the alpha-amylase enzyme develops. Alpha-amylase activity has direct impact on bread and pasta quality and adversely affects the malting process.

As little as 5 % sprouted grain, mixed with 95 % sound grain, can render the entire mixture unacceptable.

Baking

Alpha-amylase activity affects bread quality. Flour with a low Falling Number will produce bread with poor texture, a sticky bread crumb and will be difficult to process. Bread made from flour with a high Falling Number can result in loaves with poor volume and a dry bread crumb. The shelf life of the bread will also be adversely affected. It is important, therefore, to use flour with the correct Falling Number.



The Falling Number Method is also used to monitor fungal enzyme supplements. Savings are realized by optimizing enzyme additions in order to achieve the desired characteristics.

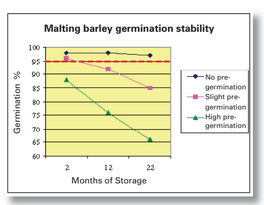
Pasta Manufacturing

Producing noodles from flour with a low Falling Number results in off-color product. The product will be sticky, making it difficult to process. The end consumer product will be sticky after it is boiled.

Using flour with the correct Falling Number will result in savings through improved processing as well as a higher quality end product.

Field Sprouting of Barley

Sound, viable grains are required for high germination rates in malting barley. Studies have shown that barley that has pre-germinated in the field has a decreased ability to germinate during the malting process, leading to high levels of beta-glucan in the wort. Even barley with a low degree of pre-germination will be affected. The ability to germinate is further decreased during storage. Only months later, barley with acceptable germination at harvest may exhibit germination abilities significantly lower than the generally required 95 %. Low levels of pre-germination are not possible to detect with visual inspection, but are readily identified with the Falling Number Method.



The Falling Number Method by Perten Instruments

The World Standard Alpha-Amylase Activity Test — AACC No. 56-81B, ICC No. 107/1, ISO/DIS 3093, ASBC

Definition: The Falling Number Method determines the alpha-amylase activity in grain, flour and other starch containing products. The Falling Number is defined as the time in seconds required to stir and to allow a viscometer stirrer to fall a measured distance through a hot aqueous flour gel undergoing liquefaction.

Principle: The Falling Number Method uses the starch contained in the sample as a substrate. It is based on the rapid gelatinization of a suspension of flour or meal in a boiling waterbath and the subsequent measurement of the liquefaction of the starch by alpha-amylase.

1. Sample Preparation

For grain, a 300 g sample is ground in a Laboratory Mill LM 3100 or LM 120 equipped with a 0.8 mm sieve. The large sample is to avoid sampling error. For flour a representative sample is taken.

2. Weighing

7.0 ± 0.05 g of whole meal or flour is weighed and put into a Viscometer tube. The flour amount should be moisture corrected by measuring the actual moisture content of the sample.

3. Dispensing

25 ± 0.2 ml of distilled water is added to the tube.

4. Shaking

Sample and water are mixed by vigorously shaking the tube to obtain a homogeneous suspension.

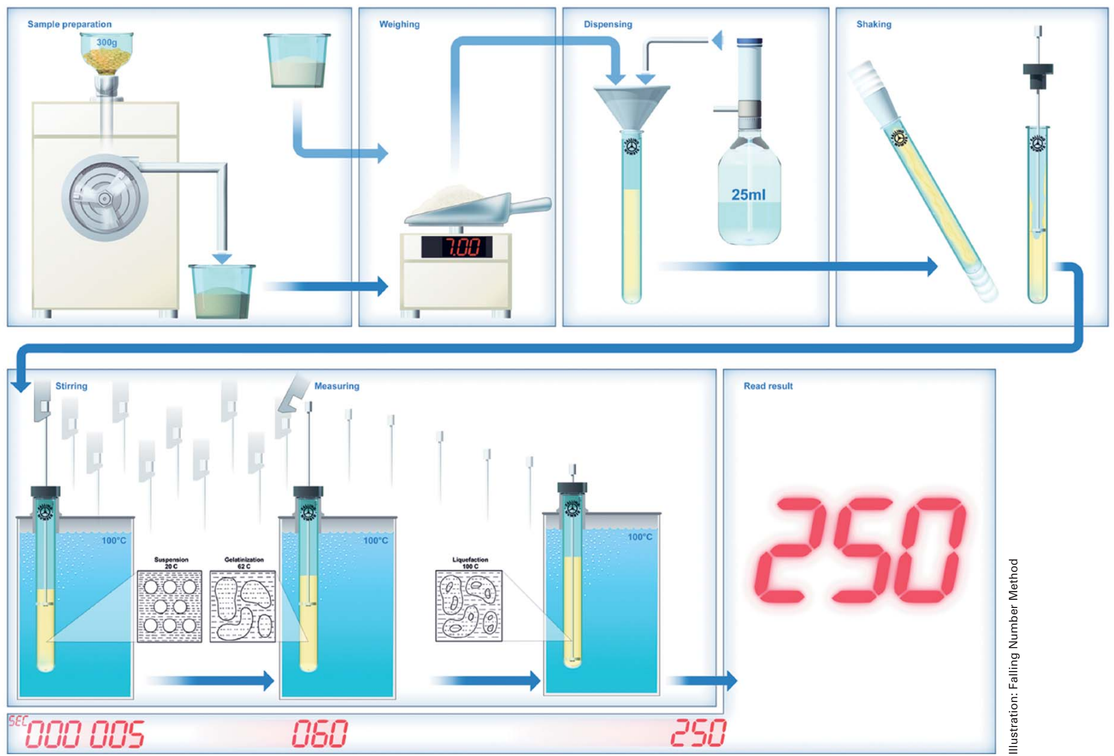


Illustration: Falling Number Method

5. Stirring

The Viscometer tube with the stirrer inserted is put into the boiling water bath and the instrument is started. After 5 seconds the stirring begins automatically.

6. Measuring

The stirrer is automatically released in its top position after 60 (5 + 55) seconds and is allowed to fall down under its own weight.

7. The Falling Number

The total time in seconds from the start of the instrument until the stirrer has fallen a measured distance is registered by the instrument. This is the Falling Number.