



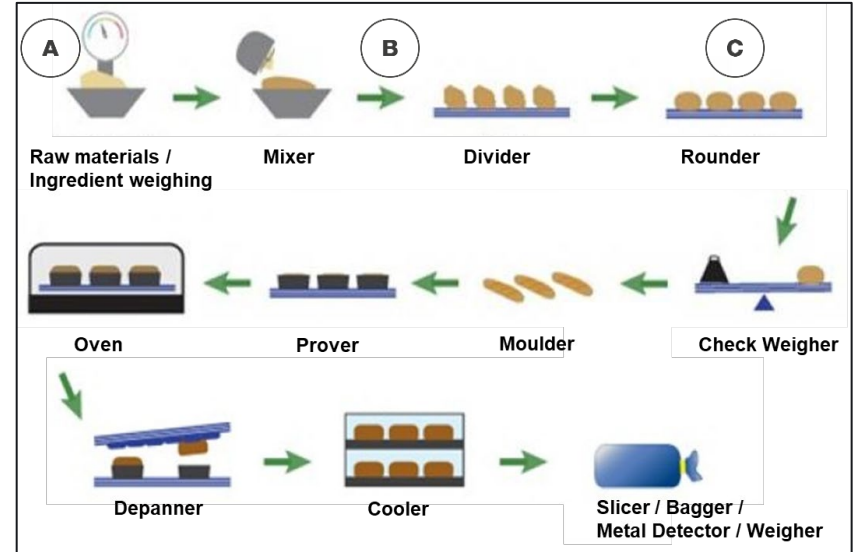
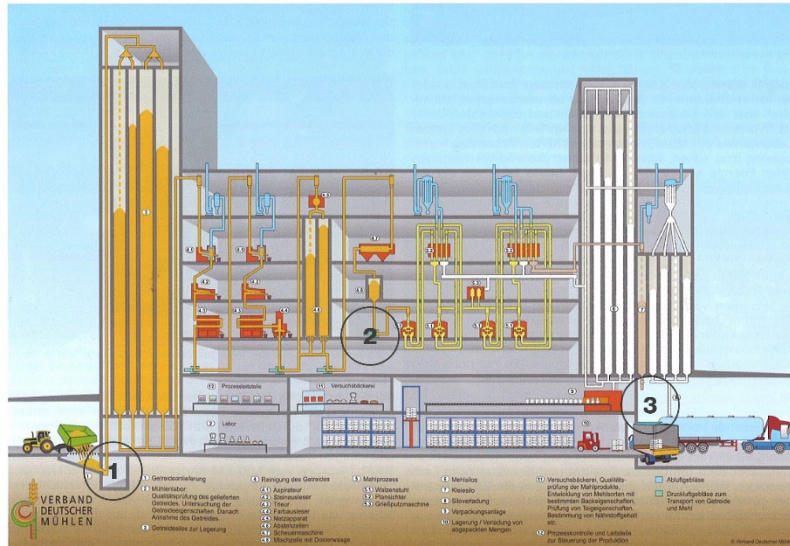
Brabender[®]
A brand of **Anton Paar**

VARESH CHIMIE BAHAR

CHALLENGES IN FLOUR & DOUGH PRODUCTION, OUR SOLUTIONS.

IRAN GRAIN 2024

WHERE IS THE BRABENDER 3-PHASE-SYSTEM APPLIED?



- 1** Grain reception
- 2** Process control during milling
- 3** Process control before delivery

- A** Flour reception
- B** Process control after mixing
- C** Process control during processing

FLOUR AND DOUGH QUALITY CONTROL WITH THE BRABENDER 3-PHASE-SYSTEM



OVERVIEW: BRABENDER 3-PHASE-SYSTEM

- › Depicts the production of bakery or pasta products on a laboratory scale in a holistic and practical manner
- › Complies with key international standards for flour quality control, such as ICC, AACCI or ISO



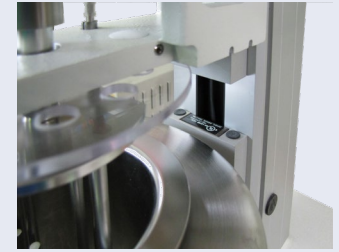
1. PHASE: BRABENDER FARINOGRAPH

- › First and worldwide most-applied instrument for measuring flour quality
- › Determines flour water absorption and kneading characteristics of dough:
 - › Dough development time
 - › Dough stability
 - › Dough softening



2. PHASE: BRABENDER EXTENSOGRAPH

- › Measures resistance to extension and extensibility of dough
- › Realistic simulation of dough preparation
- › Mapping of the usual work steps and time intervals in bakery production
- › Estimation of gluten strength, gas holding capacity, bakery product volumes
- › Visibility of the effect of additives on the dough properties



3. PHASE: BRABENDER AMYLOGRAPH

- › Measures gelatinization properties and enzyme activity of wheat, rye, maize, and rice flour and whole meal
- › Prediction of the baking characteristics of flour
- › Monitoring of the influence of enzyme addition

INCOMING FLOUR QUALITY CONTROL



RECEPTION OF UNKNOWN FLOUR

Challenge

I have received flour from a new supplier. How can I guarantee that it complies with my specifications and what can I do if it does not?

Solution

Using the FarinoGraph's reference curve function, you can define the optimum flour quality for your purpose and compare incoming flours to this reference curve. If it does not match your curve or tolerance range, you can try to improve the quality of the flour by adding flour improvers, such as enzymes, and test the recipe again with FarinoGraph.

Benefit

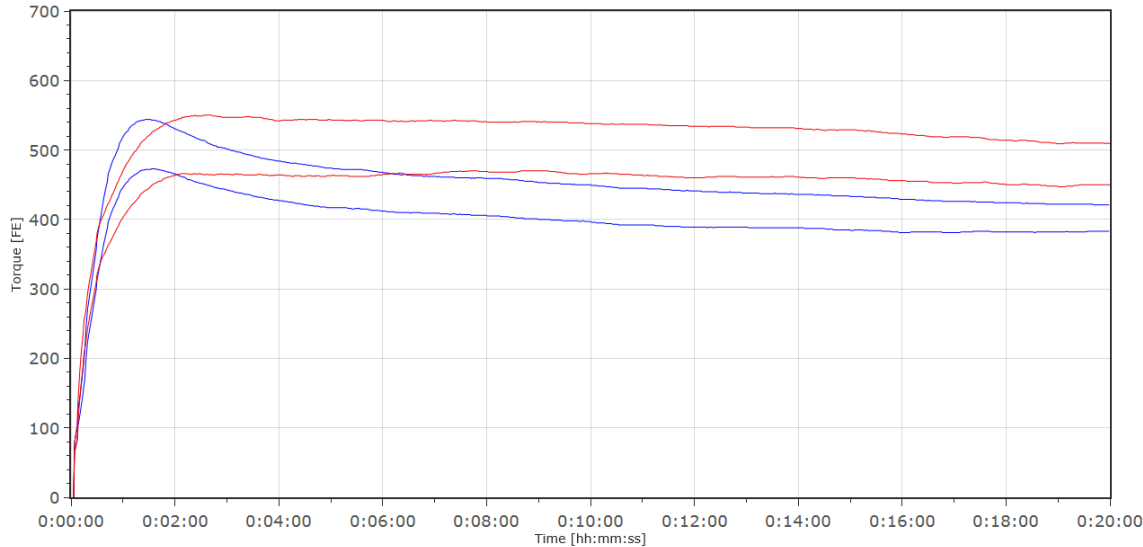
Guarantee consistent quality of incoming raw materials and thus final products independently of suppliers and make adjustments. Avoid production downtimes, waste, complaints and customer dissatisfaction due to the use of flours with inadequate properties on a production scale.

WHAT IS THE BRABENDER FARINOGRAPH?



THE WORLD'S FIRST AND MOST
APPLIED DEVICE FOR TESTING
FLOUR QUALITY SINCE 1928

THE BRABENDER FARINOGRAM – HOW TO FIND THE SUITABLE APPLICATION



■ **Strong wheat flour**

- › High water absorption
- › Long DDT
- › Very long stability
- › Low degree of softening

→ **Suitable for toast**

■ **Weak wheat flour**

- › Low water absorption
- › Short DDT
- › Short stability
- › High degree of softening

→ **Suitable for biscuits & waffles**

FORMULATION DEVELOPMENT



IMPROVING NUTRITIONAL VALUE

Challenge

Wheat, in comparison to other flours, is said to have a low nutritional value. How can I improve the nutritional value of my flour without impacting its rheological properties?

Solution

The FarinoGraph is not only useful for pure flours, but also for blends of different flours, e. g. for wheat flour enhanced with a certain content of high-protein flours, such as pulse flours (e. g. pea, lentil or fava beans). By means of the reference curve function, the formulation can be adapted in such a way that the rheological properties can be compared to the original pure wheat flour recipe.

Benefit

You can precisely adapt your recipe by finding the optimum mixture with comparable rheological properties, without “trial and error” productions on a high-volume production line, saving time and raw materials.

GLUTEN-FREE FLOURS



QUALITY OF GLUTEN-FREE RAW MATERIALS

Challenge

It is difficult to measure water absorption and kneading characteristics of gluten-free doughs, as the lid of the Farinograph mixer is pressed on during the measuring process and no homogeneous dough can be produced.

Solution

For gluten-free doughs, the FarinoAdd-S300 and FarinoAdd-S50 add-ons are available which prevents the lid of the mixer from being pushed upwards by the plastic dough and enables a good mixing of flour and water.

Benefit

Compare the rheological properties of gluten-free doughs with those of wheat doughs and make adjustments where necessary, e. g. by adding improvers such as hydrocolloids.

USE CASES



INFLUENCE OF FLOUR ADDITIVES

Challenge

I would like to improve the rheological properties of my flour with the help of additives, such as ascorbic acid or proteinase. How can I monitor the influence of the additives on the dough properties and how can I find out which would be the right dosage of these additives?

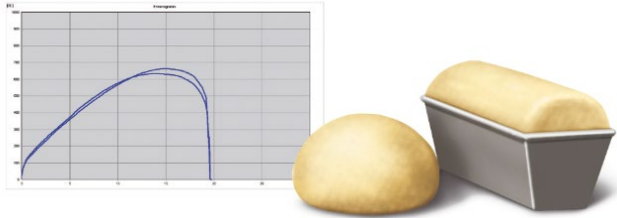
Solution

The impact of additives becomes apparent through the correlation add-on function of the Extensograph-E. This allows for overlaying curves from various trials with different ratios of flours and additives in a single diagram, providing a visual representation of variations.

Benefit

Experiment with various combinations of flour and additives to identify the ratio that aligns most effectively with the desired rheological properties, resulting in the optimal dough characteristics.

THE BRABENDER EXTENSOGRAM – HOW TO FIND THE SUITABLE APPLICATION

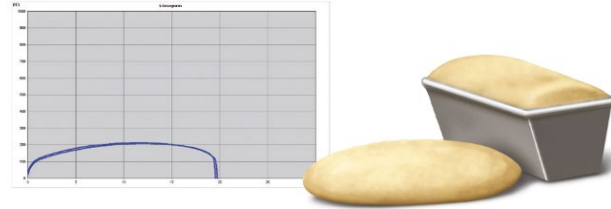


Extensible elastic gluten

- › The fermentation gas of the yeast could extend the dough
- › Baking products with a good volume and a soft crumb

Possible usage

- › Rolls
- › Bread



Soft and weak gluten

- › The dough could not keep the fermentation gas very good
- › Small baking volume

Possible usage

- › Biscuit, cakes, cookies

WHAT IS THE BRABENDER EXTENSOGRAPH-E?



PROVE OVER DECADES. A
STANDARD TOOL FOR MEASURING
DOUGH QUALITY UNDER REAL-LIFE
CONDITIONS.

USE CASES

BREAD QUALITY VARIATIONS

Challenge

The baking properties of my flours and therefore the quality of the bread vary greatly. What options do I have to ensure that the end products have a consistent quality?

Solution

The Amylograph-E can be used to realistically evaluate the baking properties of flours. At 1.5 °C/min, the temperature rise during the measurement is similar to that within a loaf of bread during the baking process. The enzyme activity, which influences the water-binding capacity of the starch by cracking its molecules, is important here. It is therefore important to check the enzyme activity during the incoming goods inspection.

Benefit

Clear agreements with reliable measurement parameters lead to a binding specification. This results in consistent flour quality, which leads to process-reliable doughs with consistent baking properties.

USE CASES

DIFFERENT FLOUR QUALITIES

Challenge

Different flour qualities are unavoidable. What options do I have here to still produce high-quality products?

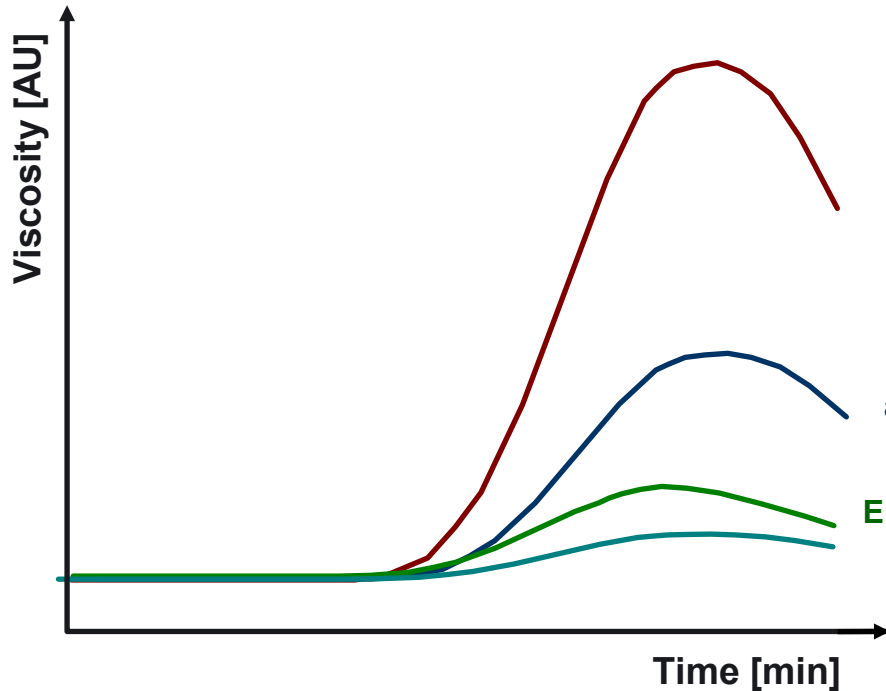
Solution

Depending on the results of an Amylogram, optimisation measures can be taken. For example, if the enzyme activity is too low, the addition of active malt flour helps me to adjust the gelatinisation properties to my requirements. Similarly, enzyme activities that are too high can be optimised by adding acid (sourdough).

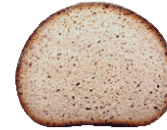
Benefit

If you know your flour, you can compensate for deviations in flour quality by adjusting the recipe. This reduces production downtime, saves money and leads to satisfied customers.

THE BRABENDER AMYLOGRAM – HOW TO INTERPRET THE RESULT



Low enzyme activity



- Small volume
- Dry taste, hard crumb
- Fast retrogradation

Enzyme activity good



- Good volume
- Soft taste and elastic crumb
- Good shelf life

Enzyme activity too high



- Wet crumb
- Starch could not bind the water
- Wet crumb with low structure
- Flat bread

WHAT IS THE BRABENDER AMYLOGRAPH-E?

DECADES-PROVEN, STANDARD TOOL
FOR ANALYZING ENZYME ACTIVITY
IN FLOURS AND WHOLEMEAL



Brabender becomes
part of Anton Paar.
Two pioneers,
one mission.

Great people | Great instruments